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Rock Products

With which is Incorporated CEMENT and ENGINEERING NEWS Founded 1896

Chicago, January 25, 1933 | Issued Monthly | Volume XXXVI, No. 1

BACK TO WORK!

THE much heralded Highway and Construction Congress at Detroit, January 16 to 21, probably to many who attended was a disappointment.

ALTHOUGH 22 national organizations of business and professional men whose livelihoods depend directly on construction held meetings of one kind or another, the attendance at the Congress proper was distinctly disappointing.

NEVERTHELESS, much real good was accomplished, which will bear fruit later. If those who did attend and absorbed some of the significance of the Congress, when they get back home, go to work, and become real missionaries, at least the lethargy of a few has been shaken out of them.

THE most was accomplished in lively discussions that took place in many places, in committees, formal and informal, of earnest men, who used the opportunity to do some serious thinking on some very broad subjects.

A CRITICISM that truthfully can be made of business men in all lines of American industry is that they are wont to take too much for granted; too prone to let some one else do their thinking for them; to let George do it; those who attended any of the meetings in connection with the Congress must now realize that the time has come for them to think and to act.

THE resolutions adopted by the Congress did not receive as much attention at the Congress as they will from now on; they are constructive and in the opinion of those who did give them serious consideration they offer a way out; no one knows that they are a sure cure; but anything is preferable to a do-nothing know-nothing policy; they present the basis for an experiment in economics; and the time has come in the opinion of many to do some experimenting.

THE high points of these resolutions were: (1) Careful advance planning of public works; (2) finance sound public works from capital account rather than from current income; (3) liberalize the Emergency Relief and Construction Act; (4) continue generous Federal aid for highway construction; (5) do not divert gasoline and motor vehicle taxes from their purpose—highway construction and maintenance; (6) reduce interest charges; (7) revise bankruptcy laws to give debtors a chance; (8) if inflation of currency becomes necessary, have controlled inflation by issuing currency based on labor and materials actually expended in useful construction.

HOWEVER radical some of these measures may appear at first reading, we urge a thorough thoughtful consideration, and judgment based on such consideration and on mature reflection rather than on prejudices and previously biased opinions; for we are at the threshold of a new era in the development and growth of civilization; we all want orderly evolution and not revolution.

LET us put our brains, and energies to work; if they do their duty to their training, inheritance and environment, they will put men and money to work.

—The Editors

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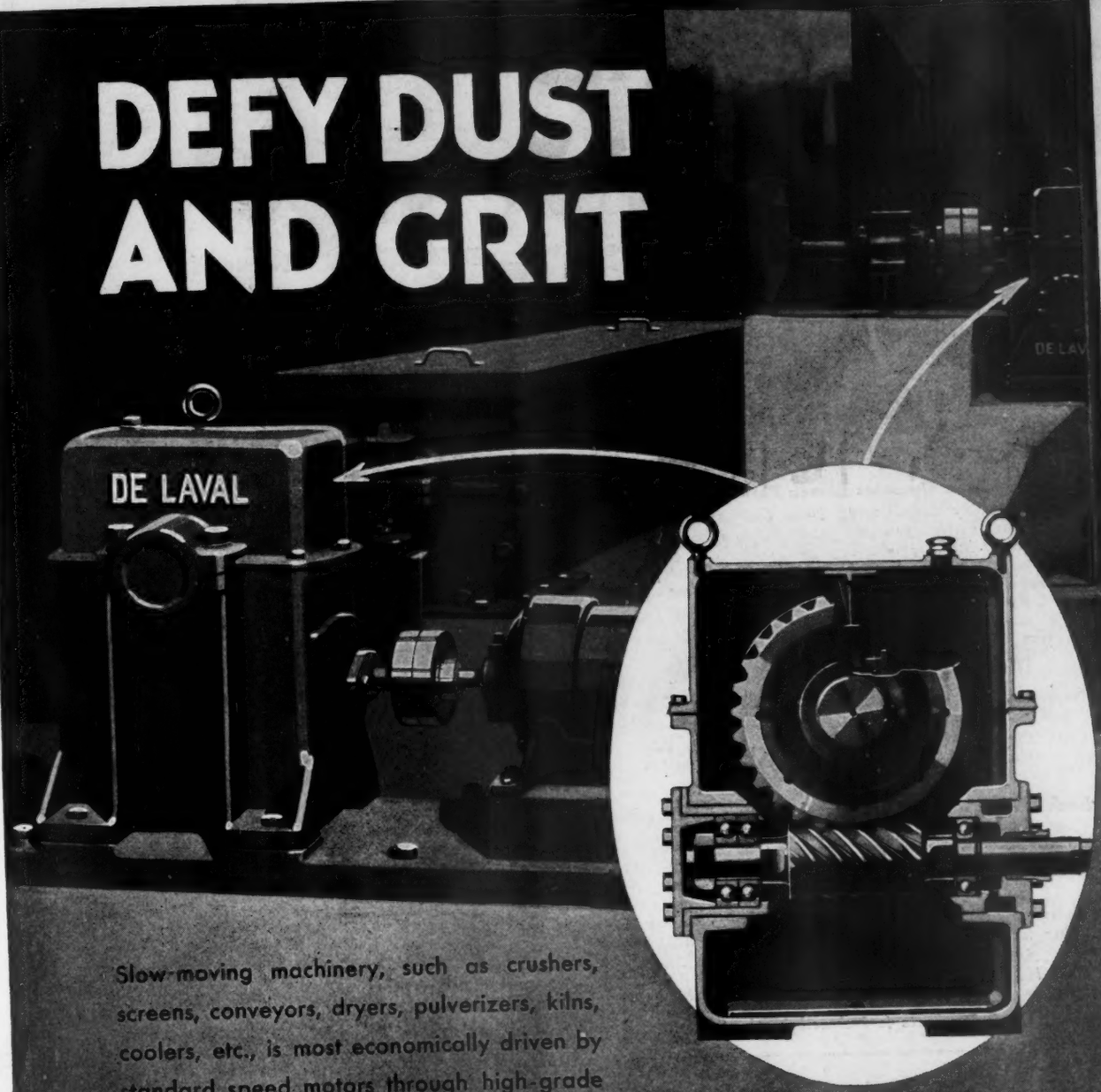

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With which is Incorporated CEMENT and ENGINEERING NEWS Founded 1896

Volume XXXVI | Chicago, January 25, 1933 | Number 1

Stone Producer Operates Eleven Plants in State

Kentucky Consolidated Stone Co. Has Brought About Better Operating Conditions and Improved Marketing of Product

WHILE Kentucky has no large metropolitan areas such as are found in some of the other states, there are many medium sized towns and cities which use a considerable amount of aggregates. For this reason the typical quarrying operation in the state is only of medium size although the plants as a whole turn out a large volume of material. These quarries extend from the eastern mountainous region well over to the western portion, although they are not found in the extreme west. The hilly sections of the state contain large deposits of limestone throughout the whole area and these have been developed as needed by a number of producers.

One of the largest operators is the Kentucky Consolidated Stone Co. with general offices at Louisville, which has eleven plants scattered well over the whole state. This company is a consolidation of a number of smaller producers and was organized to reduce duplication of organization and to gain better merchandising facilities. Most of the product goes for roadwork, particularly since the decline in general building construction. In what follows five of the eleven plants of the company will be described as typical of the operations.

Stephensburg Plant

The Stephensburg plant, located some 50 miles south of Louisville and a few miles west of Elizabethtown, is one of the company's steadiest producers because of the demand for stone in and around Louisville and because of the number of highways

Stephensburg quarry of the Kentucky Consolidated Stone Co.

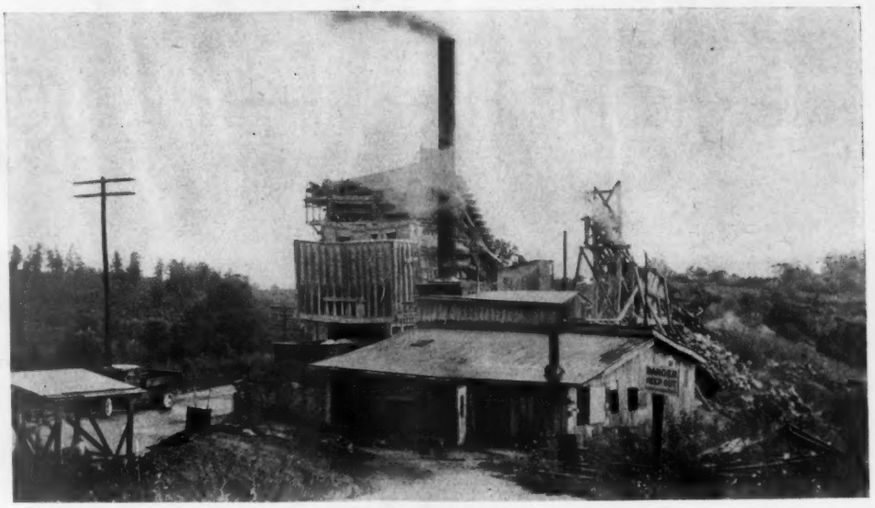
being built or surfaced in that district. It has a production capacity of about 500 tons daily.

The quarry face has an average height of about 70 ft. and considerable stripping has to be removed, amounting in places to 30 or 40 ft. This is removed with a power shovel, loading to trucks. The rock is a fine-grained limestone of good quality lying in almost horizontal strata and showing no evidence of disintegration from weathering. There is, however, a 5-ft. layer of soapstone about 16 ft. down from the top of the rock and below this is a 50-ft. face of good stone. As the soapstone must be discarded, the quarry is worked in three ledges.

First, the upper 16 ft. is drilled and shot down into the quarry, drilling being done with a Denver derrick drill. The holes are spaced 6 ft. apart and 12 ft. back from the face. After this ledge has been removed the soapstone is quarried in a similar manner, except that care is taken that none of it is shot down on to the floor below, and it is loaded to trucks and removed. The lower ledge is then drilled and shot as one bench, as many as 40 holes being fired at a time. Very little secondary blasting is required, but where necessary Ingersoll-Rand "Jackhamers" are used for the drilling.

A ¾-yd. Erie steam shovel is used in the quarry, loading to end-dump steel cars which are moved on the quarry tracks by a Fordson tractor mounted on car wheels. At the shovel a second track is used so that empty cars can be left upon one track while the loaded cars are taken from the other. Also at the foot of the incline a run-around track permits the tractor to drop off the loaded cars from the shovel and to pick up from the other track the empty cars returned from the plant. In this way the one tractor handles all the cars loaded by the shovel and does not have to wait at either end while cars are being loaded or unloaded. Normally there are three trains of two cars each in operation. Thus two cars are being loaded and two being dumped at the plant while the tractor is taking two others to the foot of the incline.

The cars are dumped automatically at the top of the incline to an Austin gyratory crusher. This discharges to a bucket elevator which carries the crushed rock up to the top of the plant and delivers it to a 40-in. by 14-ft. Telsmith revolving screen. The oversize from the screen is spouted to a 3-ft. Symons cone crusher located near the primary crusher and discharging to the main bucket elevator. The sized material from the revolving screen is spouted to bins below, these spouts having old screen sections in the bottom to remove the dust, which is then chuted to a bin and sold as agstone.



Stephensburg plant of the Kentucky Consolidated Stone Co.

The plant is steam engine driven through a main line shaft and belting. A Sullivan compressor supplies air for the quarry drilling. A large part of the product is shipped by rail, the plant being located on the Illinois Central railroad, but highway connections are good so that truck shipments are also made for highway work. Marvin Sell is superintendent.

Upton Plant

The Upton plant, located about 15 miles from the Stephensburg plant, has also been a steady producer for years. The quarry is not as deep as at Stephensburg, although in some places the face reaches a height of 50 ft. There is very little overburden and stripping is a minor problem. The deposit is well stratified and shows both gray and brown limestone. Blast holes are drilled with well drills under contract, about 15 holes being shot at a time.

Stephensburg quarry, showing nearly horizontal stratification

A ¾-yd. Erie steam shovel mounted on caterpillar treads is used for loading in the quarry, the same shovel also being used to reclaim material from the stock pile. The quarry cars are of all-steel construction and are drawn by a Fordson tractor mounted on car wheels and operating on narrow gage track.

At the crushing plant the cars are pulled up the incline by a Byers single-drum hoist. This is belt-driven from the main line shaft which is driven by a 75-hp. General Electric motor. The cars dump to an Allis-Chalmers gyratory crusher which discharges to a bucket elevator carrying up to the top of the plant.

A revolving screen on the top floor does the sizing and the rejects are spouted back to a 6-in. McCully fine reduction crusher. The discharge from this crusher falls to the same bucket elevator and is returned to the revolving screen. The secondary crusher is belt-driven by a 50-hp. Allis-Chalmers motor.

The sized material from the revolving screen can be spouted direct to bins below or run over a single deck vibrating screen to remove the fines. This fine material is sold as agricultural limestone ("agstone"): Excess material is stockpiled by truck.

A Gardner air compressor of 160 c.f.m. capacity and driven by a 25-hp. General Electric motor supplies air for drilling. The plant is located on a branch of the Louisville and Nashville railroad and shipments are made either by rail or truck. Roy Gaddie is superintendent.

Russellville Plant

The Russellville plant, about 30 miles west of Bowling Green, is the farthest west of the company's operations and produces most of its output for that end of the state. It has an output of about 600 tons per day.

This quarry also has a layer of undesirable material dividing the face into two parts and which must be removed. There is a clear 60-ft. face of good stone from the quarry floor up to a 5-ft. shale seam and above that another 30 ft. of limestone. The overburden reaches a maximum depth of 12 ft. and is removed with a shovel and trucks.

An Armstrong well drill is used for putting down the blast holes, drilling 5⅝-in. holes. The upper ledge is first shot down into the quarry and removed to the plant, care being taken that none of the shale seam

Russellville quarry and plant

is included in the shot. The exposed shale is then drilled and shot, taking care that none of it gets into the quarry, and is then removed in the same way as the strippings. On the main 60-ft. face, the well drill holes are spaced 15 ft. apart and when more than one row of holes is to be shot at a time the holes are staggered to get a better shattering effect. About 350 lb. of 65% Hercules dynamite are used for each hole.

A ¾-yd. Marion steam shovel is used for loading the broken rock in the quarry, with a ¾-yd. Erie steam shovel as a standby. Two steel quarry cars are used which are alternately drawn to the plant by a steam-driven Lidgerwood hoist and cable. A cable more than 700 ft. long is used in order to reach all parts of the quarry. A double track at the shovel permits spotting the empty car on one track and picking up the full car from the other.

The quarry cars dump to a 20-in. Allis-Chalmers gyratory crusher and the discharge from this crusher is carried by a bucket elevator to a scalping screen at the top of the plant. From this 48-in. by 20-ft. revolving scalping screen the oversize falls to a short belt conveyor which carries it to the secondary crusher. This is a 14-in. Worthington gyratory crusher located near the primary crusher and discharging to the bucket elevator.

The undersize from the scalping screen goes to a revolving sizing screen from which the sized material is spouted to the bins below. The stone can also be put through a small trommel screen before going to the bins to remove all fines and dust. This is collected and sold as agstone. Agstone is also produced by reducing the fines from the sizing screen in a Sturtevant pulverizer.

The plant is steam driven and compressed air for drilling is supplied by a motor-driven Curtis air compressor. Below the screens are four bins, with a total of about 250 tons capacity. Loading to railroad cars is done on a track below the bins and to trucks alongside. Rock can also be loaded direct from the quarry cars to railway cars if desired by means of a switch and trestle over the railroad loading track.

Most of the product is used in road construction. Some of this is shipped out over the Louisville and Nashville railroad which runs past the plant, but the larger part of it goes out by truck. W. C. McMahan is superintendent.

Mt. Vernon plant

Mt. Vernon Plant

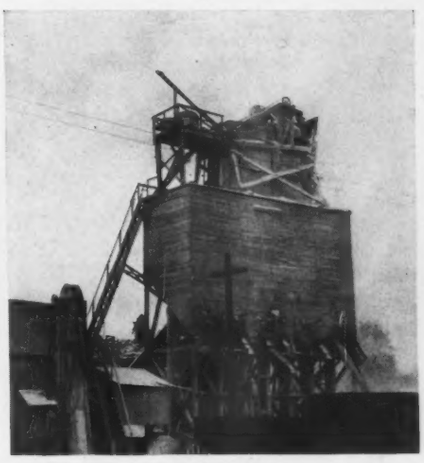
Well over toward the eastern end of the state is the Mt. Vernon plant, located near the town of Mt. Vernon. As is evident from its size and depth this quarry has been operated for many years.

The stone is of good quality, clean and tough and showing no cracks or seams in its structure. Very little stripping is necessary. The face, which is nearly 90 ft. high at some points, is shot as one bench, well drills being used for making the blast holes.

The quarry is circular and the loading track follows the face so that the shovel can be worked at any point without having to shift the track. A Fordson tractor mounted on car wheels pulls the empty cars out to the shovel and pushes the full cars on around to the incline. The track branches off from the loop to the incline and is double at the foot of the incline, so that the tractor can spot the full cars on one track and pick up the empties from the other. The empty cars are dropped back to the circular track by gravity before being coupled to the tractor so that the tractor may be in front. The tractor normally handles a train of three cars and a total of nine cars are generally used. Thus, three are being loaded and three are at the incline while the other three are being moved by the tractor. When three-car trains are operated, the steam shovel loads two of the cars while the third is loaded by hand. All of the quarry trackage is narrow gage.

A single-drum steam hoist pulls the quarry cars up the incline and they are automatically dumped to an Austin No. 7 gyratory crusher. The crusher discharge is carried up by a bucket elevator to an Austin

Another view of Russellville quarry



Another view of Mt. Vernon plant

revolving scalping screen equipped with wire mesh screen sections. The oversize from the screen is carried by a belt conveyor to a 14-in. Superior McCully crusher for recrushing and the discharge from this crusher is returned to the same bucket elevator. Thus the scalping screen and recrusher are in closed circuit.

The throughs from the scalping screen are taken by another bucket elevator and delivered to a sizing screen above the bins. This is a Kennedy revolving screen equipped with two jackets, the outside jacket being used entirely for dust elimination and the other for the fine sizing. The graded material falls to the bins below which have sloping bottoms so that the stone will flow out more readily. Cars are loaded on a track alongside the bins. The plant is steam-driven and air is supplied by a steam-driven Ingersoll-Rand air compressor.

Another view of Mt. Vernon quarry

High Bridge Plant

The High Bridge plant is located in a hilly section lying between Danville and Frankfort. This is one of the oldest quarries of the company, some 35 years old, but the plant itself is comparatively new.

The quarry is circular in shape and has a depth of more than 100 ft. in two ledges. At present the lower face, about 35 ft. in height, is being worked. Drilling is done with an Ingersoll-Rand air drill and the holes are spaced 6 ft. apart and 6 ft. back from the face. Very little secondary shooting is necessary.

Loading is done by a steam shovel to Western type side-dump cars which are moved from the shovel to the foot of the incline by Fordson tractors fitted with solid tires. The tractors travel alongside the track and that part of the quarry floor has been leveled off so that they can operate smoothly. Two parallel tracks are used between the incline and the shovel so that the empty cars can be taken to the shovel and the full cars returned without interference.

The cars are pulled up the incline by a Lidgerwood single-drum hoist driven by an 80-hp. General Electric motor and are dumped to a 28- by 36-in. Traylor primary jaw crusher. The discharge from this crusher is then carried by a belt conveyor to an Allis-Chalmers gyratory crusher and a No. 5 Symons crusher for further reduction. From these crushers the material is carried by a bucket elevator to the top of the plant and discharged to a 40-in. by 20-ft. scalping screen. The oversize from this screen (plus 1½ in.) is spouted to a No. 6 McCully gyratory crusher which discharges to the bucket elevator. The throughs from the scalping screen fall to a Hum-mer double-deck vibrating screen with 1-in. mesh wire cloth above and ¼-in. mesh below. Normally the plant makes three sizes—concrete stone, chips and screenings—which are spouted from the vibrator to bins below.

The plant has six bins with a total capacity of about 500 tons and railroad cars and trucks are loaded below the bins. This plant can turn out 600 tons of graded stone in a 10-hr. day or 1000 tons per day when the stone does not have to be crushed to the smaller sizes.

Recently the Southern Amiesite Asphalt Co. has put up a road material plant adjoining the stone crushing plant. The plant of that company includes two large concrete storage silos as well as heating equipment and a belt conveyor to handle the stone from the crushing plant.

High Bridge plant—Asphalt mixing plant in foreground

General

The five plants which have been described

Quarry at High Bridge

are typical of the eleven operations of the company. The consolidation of the various smaller companies into one large organization has resulted in better management and more efficient operation and in better selling and marketing facilities. The plants are widely scattered, so that their products can easily be shipped well over the entire state. One result has been that with the plants located as they are it is possible to ship material from the nearest quarry, thus avoiding excessive cross hauling so common where there are a number of small companies. Also, when the demand does not warrant keeping all plants running, some can be shut down and the territory of the closed plant be served by others.

The general offices of the company are in Louisville. Sterling S. Lanier, Jr., is president, V. C. Morgan is secretary-treasurer and Lister Gaines is general sales manager.

A Successful One-Man Silica Sand Operation

By Edmund Shaw
Contributing Editor, Rock Products

ON THE UNION PACIFIC RAILROAD, near Las Vegas, Nev., is an interesting silica sand operation owned and operated by Harry E. Blood of Los Angeles, Calif. It is interesting because it shows that a man with a thorough knowledge of a specialty business may still make a success of it with a moderate or comparatively small capital investment, even in these days of low prices and fierce competition. And it is also interesting because it shows how new markets may be developed by a good business man who is quick to see the possibilities of a new development or discovery.

The deposit covers a square mile, at least, and is 400 to 500 ft. thick, judging only by the exposed face. The sand rock is of excellent quality, for without any washing the silica content runs from 97.5% to 98.5%. The grains are rounded and the iron content is low, the combined iron and alumina being 0.09%.

The method of working is of the simplest. Ingersoll-Rand hammer drills are used, driven by a compressor of the same make. Holes are put down to a depth of 5 to 6 ft. and shot so as to break the ground into shallow benches. The broken rock is loaded into trucks on a lower level. A part of the feed to the plant is chuted down to the plant hopper, which the steepness of the face permits.

The rock is broken in a small jaw crusher of unknown make and then sent to Isbell screens, made in Los Angeles. These are in closed circuit with a pair of rolls, like the crusher of unknown origin. Screens are either 40-mesh or 60-mesh, the change being made according to the orders to be filled.

A sample of the ordinary product through 40-mesh had this sieve analysis:

Through 35 on 40	0.6%
Through 40 on 60	9.3%
Through 60 on 80	15.5%
Through 80 on 100	28.0%
Through 100	46.6%

The sand is taken to the railroad by truck and shipped in open-top gondola cars to Los Angeles, 300 miles away.

This operation is admittedly crude and could not be made to pay if production were on a larger scale. So the next step will be the building of a larger and somewhat more modern plant at the railroad. Mr. Blood told the writer he had made a considerable study of the advantages and disadvantages of placing the plant at the quarry, at the railroad and in Los Angeles, and it worked out cheaper to put it at the railroad. Since there is no waste product, the writer was curious to know why. The answer was that any advantages of cheap labor, nearness to market, and general convenience, which were given by placing the plant in the city, were more than offset by high taxes, assessments for streets, sewers and the like, and the costs of licenses, inspections and other things that are demanded of the city manufacturer.

The sand rock is worked in shallow benches and moved by truck to the plant hopper

The greater part of the product is sold to foundries making steel castings and for refractory purposes. Mr. Blood was thoroughly acquainted with this market before he acquired the business, because he has been selling silica sand for a good many years. He was formerly with one of the large Ottawa, Ill., silica sand companies.

The new market which Mr. Blood has recently developed for his sand is that of using it as an admixture or void filler in concrete sand. This came about mainly through the investigations of C. A. G. Weymouth, a Los Angeles engineer, who has made an extensive research of the grading

Holes for the benches are put down 5 to 6 ft.

of concrete aggregates and has found that most concrete sands are deficient in fines, so much so that the addition of fine sand up to a certain very definite limit may actually decrease the water-cement ratio for equal strength and slump instead of always increasing it, as was previously believed. He sold this idea to several engineers, who accepted it the more readily, perhaps, because there was already some blending of unwashed sand with concrete sand practiced where the work was to be finished.

Fine silica sand was tried, being easily available, and it was found to give considerably higher strengths than could be obtained by blending with ordinary fine sand. And the sand from Mr. Blood's operation gave somewhat higher strengths and perhaps a little better workability than some other silica sands that were tried, according to a report made by the engineer of one of the large public service corporations. As a result of this and other reports, Mr. Blood has been able to build up a little business in selling sand to use in concrete.

The figures from one of the reports of a large public service company follows:

	7-day strength lb. per sq. in.	28-day strength lb. per sq. in.
Plain concrete	1430	2500
	1315	2670
	1330	2310
Average	1358.3	2493.3
With Nevada (Blood) silica sand	1950	3050
	1880	3110
	1900	3290
Average	1910	3150
With another silica sand	1810	2570
	1860	2600
	1800	2570
Average	1823.3	2586.3
With 17% extra cement	1950	3240
	2015	3460
	2010	3220
Average	1991.6	3340

The better effect of the Blood silica sand is ascribed to its rounded grains and comparative freedom from alumina, although it is not clear how a trace of alumina could affect strength or workability.

It is encouraging to come across a venture of this kind in which success is an individual accomplishment, due to a sound knowledge of a product and the market for it, rather than to a heavy capital investment and the grace of great financiers.

Mr. Blood's offices are in the Rives-Strong Building, Los Angeles, Calif.

Keen for All Economies

A CORRESPONDENT reports: "As a peddler of machinery and machinery parts I do not see a great deal of encouragement to look forward to right away. Our business in manganese-steel parts has been better this year than for several years, and it appears from this fact that users of machinery have it in mind to use parts that will make for the most economy."

Drivers Share in Earnings of Their Trucks

By Willis Parker

THE PLAN used to compensate the drivers of the trucks of Graham Brothers, Inc., producers and distributers of sand, gravel and crushed stone in southern California, with headquarters at Long Beach, tends to reduce distribution costs and to increase the efficiency of the delivery service. Briefly stated, the drivers are paid a percentage of the earnings of their trucks, according to D. K. Brymer of the company's transportation department. This means that the delivery department is somewhat segregated from the production department and operates as a separate organization.

Twice a month the driver gets a check representing a percentage of the gross earnings of his truck. This is equivalent to a wage of from $4 to $5 a day. Then every three months he receives another check representing a percentage of the NET earnings of his equipment—usually termed a bonus. The percentage of the net is not the same for all drivers; it varies from 50 to 75%, depending upon the age of the equipment and the previous service rendered by the driver. However, it is not uncommon for a driver to earn more than $200 a month.

To explain in more detail the reason for the sliding scale of percentages of net earnings, Mr. Brymer declares that a new truck will accomplish more work at less cost than an old one, because it requires less time in the shops for service and repairs. Hence, its driver is not entitled to as high a percentage as is the driver who has the handicap of operating an old vehicle. The varying scale, then, tends to equalize incomes, though it does not penalize the man who is willing to work harder and longer than many of his fellows.

Every item of expense is charged to the truck—gas, oil, tires, repairs, washing, painting, insurance, depreciation, garage and overhead expense—before the net earnings are computed.

Takes Care of Recklessness and Overtime

It is apparent that this system encourages the drivers to take better care of their equipment, and to run their trucks into the shops only when absolutely necessary. Yet it encourages them to watch for minor ailments, the immediate adjustment of which will prevent many hours in the shops for the truck and idleness for the driver.

Furthermore, it eliminates shirking on the part of the drivers as often is the case where men are paid by the day or the hour. Nor is there the problem of overtime. Every driver is willing to make one, two, or three deliveries after the usual quitting time, to enable his truck to earn more money and thus increase the size of his checks. Any driver who does not earn a bonus is not wanted by the company.

Sometimes the demands upon the delivery department are so heavy that night work is required. The driver cannot be expected to work day and night; so a second driver is assigned to the truck, but only after he has been approved by the regular driver. The second driver is paid by the ton or by the hour, while the earnings of the truck are credited to the regular driver, which makes him, as it were, foreman of his equipment and a participant in its earnings.

The more work that can be gotten out of a truck in a given length of time, the lower is the unit cost. This makes it desirable to operate the equipment long hours while the compensation plan encourages the drivers to stay with it. Furthermore, it reduces the number of units required of outside trucking companies during peak periods, for the company operates about 90 trucks, which suffices for minimum needs. The trucks are apportioned to the firm's branch distributing depots, which are scattered far and wide over southern California, and they are shifted from one depot to another as the demand for materials fluctuates.

Will Make Greater Real Use of Modern Developments!

A CRUSHED-STONE COMPANY executive provides this thought: "Our belief is that the future development will be toward more small plants and fewer abnormally large ones; the smallest plant, consistent with low cost, so as to market the bulk of the production in its immediate vicinity, receiving the best market price for its entire production. Unquestionably, the future trend must be toward tying in industry with agriculture—meaning by this that the workers will live in large measure on farms, large or small, devoting a part, or all of their time, which would otherwise be idle, to working in the local industries, drawing the bulk of their actual living from the farm, which will enable them to work for moderate wages, but their actual real income would be materially enhanced. We understand that the statistics on electrical consumption indicates that all, or the greatest bulk, of the increased use of electricity over the last five or six years has come from towns and villages of less than 10,000 people. We do not believe that the country generally has realized the vast changes which are being brought about by good roads, automobiles, both passenger and truck, and cheap electricity. In planning for the future, this must be taken into consideration."

New Sand and Gravel Plant in the Boston District

Concrete Materials Co., Saugus, Mass., Also Plans to Erect Crushed Stone and Ready-Mixed Concrete Plants

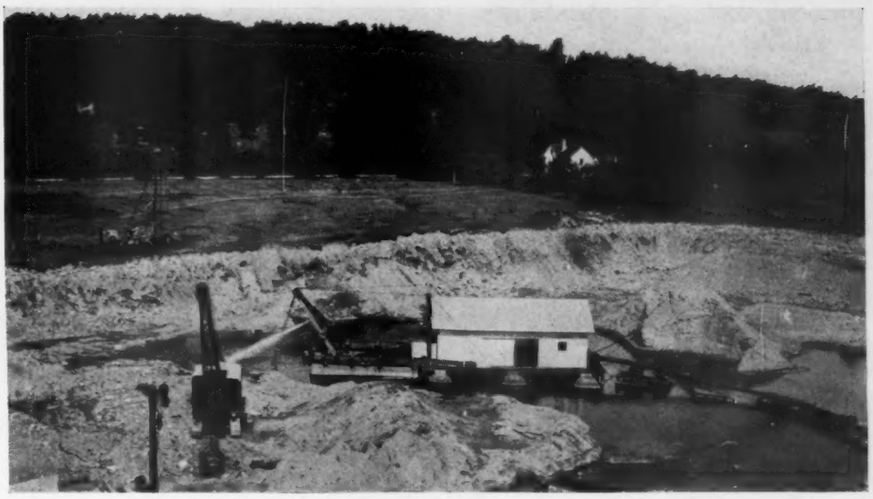
By W. R. Carmichael
Engineer of Construction

IN THE PRODUCTION of aggregates for concrete it is not often possible for the operating company to secure a site where sand, gravel and rock lie in adjoining natural formations. The acreage controlled by the Concrete Materials Co. of Saugus, Mass., is, however, an exception, in that a water bearing deposit of gravel lies immediately adjacent to a high ledge of trap rock.

For several years material has been taken from these deposits in a small way by local owners, but this season the property was taken over by the Concrete Materials Co., an experienced organization, whose intention is to produce and distribute, on a larger scale, concrete aggregates and ready mixed concrete. As the first step in this program the sand and gravel washing and screening plant has been completed. This unit has a capacity of 200 tons per hour but has been so designed that additions may be easily made to increase this tonnage should future demand necessitate it. Machinery of the latest type and of proven worth has been installed throughout.

The gravel deposit, with 1 to 1½ ft. of overburden, extends to a depth of approximately 50 ft. and all but 15 ft. of this lies below the water level. Because of this and the availability of a reliable source of power nearby, the hydraulic dredging system was adopted for excavating and transporting the gravel to the plant.

The dredge is of steel construction and modern design and is of the pontoon type, using as pontoons cylindrical steel tanks of double-riveted construction. These tanks are securely anchored to a structural steel frame which supports the steel floor and serves to distribute to the pontoons the unbalanced loads which occur when tough digging is encountered. The superstructure is of light structural shapes covered with corrugated galvanized steel sheets and ample openings were provided for light and ventilation.



General view of dredging operation

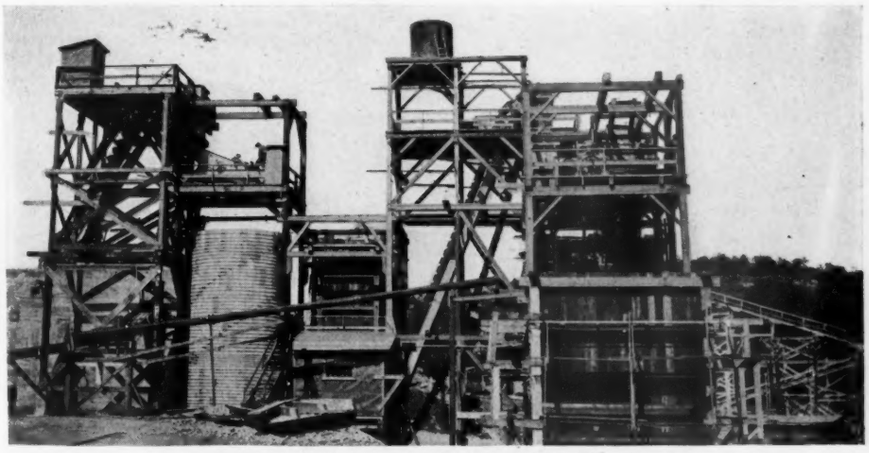
The dredge pump is a 12-in. Morris heavy duty manganese steel pump which is mounted on a common base with a 350 hp. General Electric motor, and is direct connected to this motor by means of a flexible coupling. The motor has a speed reduction of 50%, provided by a bank of continuous duty grids, and is handled by a drum controller mounted adjacent to the hoist lever bank. Priming is accomplished through the agency of an ejector operated by a high pressure water stream supplied by a 2-in. Morris centrifugal pump.

The boat is equipped with an Eagle "Swintek" screen nozzle ladder, with manganese steel in all parts subject to abrasive wear. This unit is controlled by a 3-drum Thomas hoist with banked levers. The lever bank also includes a special lever to operate the Swintek drive mechanism.

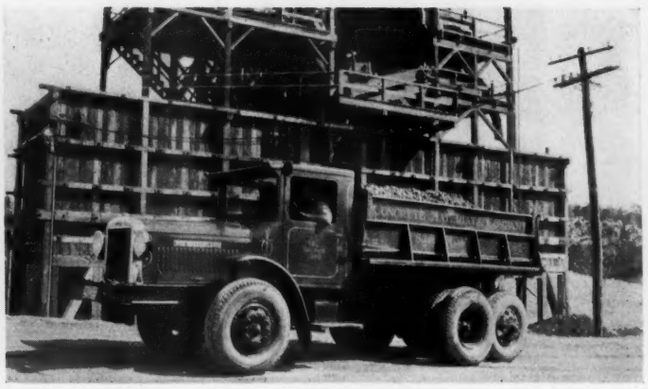
To assist in breaking down the bank, the boat is provided with a 4-in. Morris high pressure pump supplying water through a 4-in. line to a deluge type Universal nozzle mounted on the ladder A frame. This pump also supplies water to an agitating jet terminating at the Swintek nozzle.

The usual gages and meters are mounted on a panel board near the operators platform. In addition, this board contains an electric signal horn connected to signal buttons in the screening plant by means of a flexible waterproof cable.

The motors for the 12-in. pump and for the 4-in. pump are operated at a voltage of



General view of plant, loading bins at right



Two views of delivery trucks, with scale house and bins beyond

2300. Those for the 2-in. pump, the Swintek drive and the Thomas hoist are supplied with 220-volt current from a bank of three transformers mounted on the boat. These transformers also supply 110-volt current to the interior lighting mains and to the exterior flood lighting system. Power at 2300 volts is furnished to the boat by means of a submarine cable.

The dredge pump discharges through a flap valve to the 12-in. line. This line leaves the boat by means of a flexible rubber hose and is carried to shore on pontoons made of steel oil barrels assembled in a timber frame. A flexible hose connects the floating line to the shore line, and from this point the pipe is carried on bents to the dewatering tank.

The aggregate is removed from this tank by a 36-in. Link-Belt dewatering elevator. This elevator is provided with manganese castings at all wearing points, and is powered by a 30-hp. squirrel cage motor, controlled by push buttons located at key points throughout the plant.

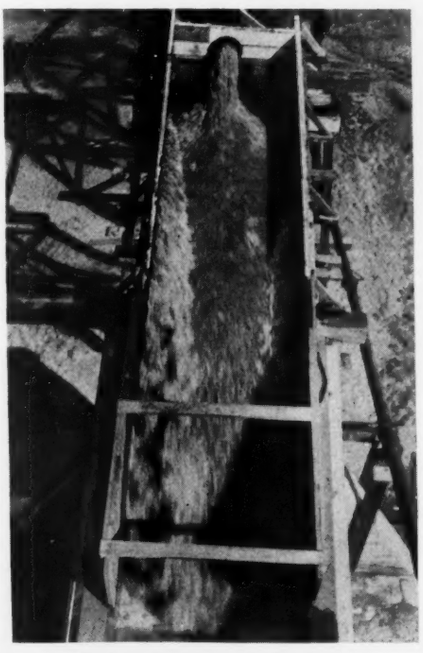
The product is discharged from the dewatering elevator into a steel hopper and in turn passes to a 4- by 8-ft. Stephens-Adamson vibrating screen. The rejections from this screen are delivered through a steel chute to a bin adjacent to the crusher, while the material passing through the screen drops directly into a 16-ft. diameter concrete silo. These two bins act as storage reservoirs and take care of any surge which may occur in the delivery of the gravel from the dredge.

The oversize material passes from the storage bin to a 10-in. Newhouse crusher and is discharged from this crusher to a chute leading to the elevator boot. This boot also receives the screenings from the silo through the agency of an Allis-Chalmers apron feeder.

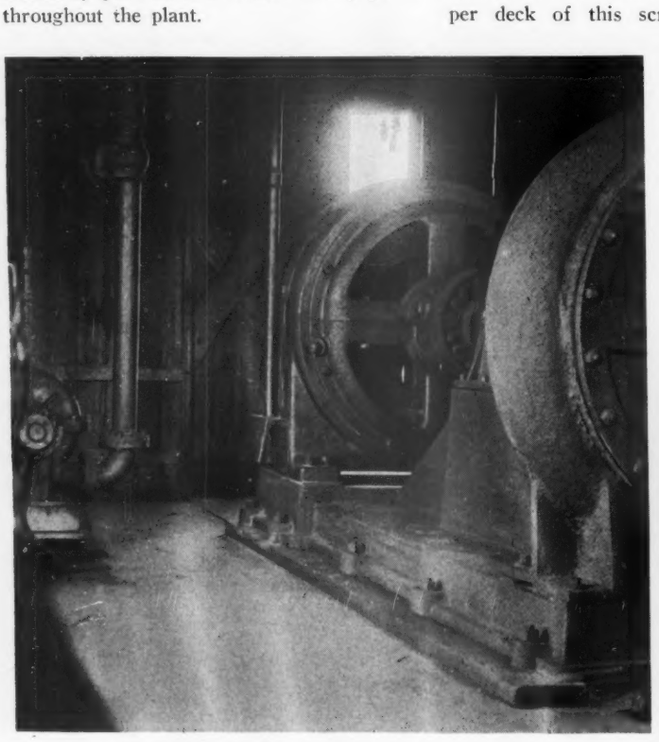
From the elevator boot a 30-in. Telsmith elevator carries the material to a steel hopper which discharges onto a 5- by 10-ft. Allis-Chalmers vibrating screen. The upper deck of this screen produces 1½-in. gravel which falls direct to the bin. The lower desk delivers its product by means of a 20-in. belt conveyor to a 4- by 8-ft. Stephens - Adamson vibrating screen and the fines pass through a steel chute to the sand screws.

The upper deck of the 4- by 8-ft. screen delivers 1-in. gravel direct to the bin and the lower deck delivers pea gravel to another bin. The sand from this screen joins the sand from the 5- by 10-ft. screen and is then passed through twin Telsmith sand screws to the sand bin.

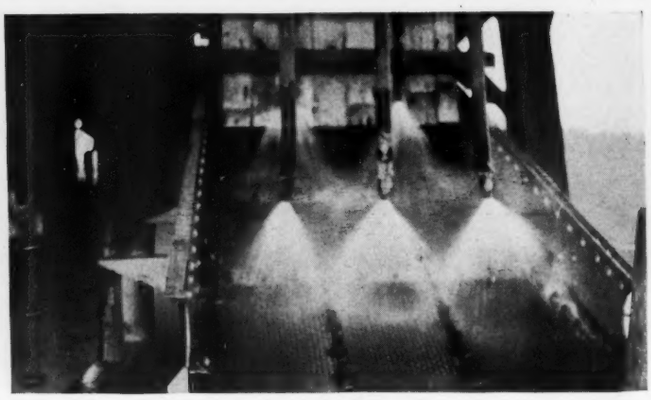
In order to secure an absolutely clean



Discharge from dredge pump

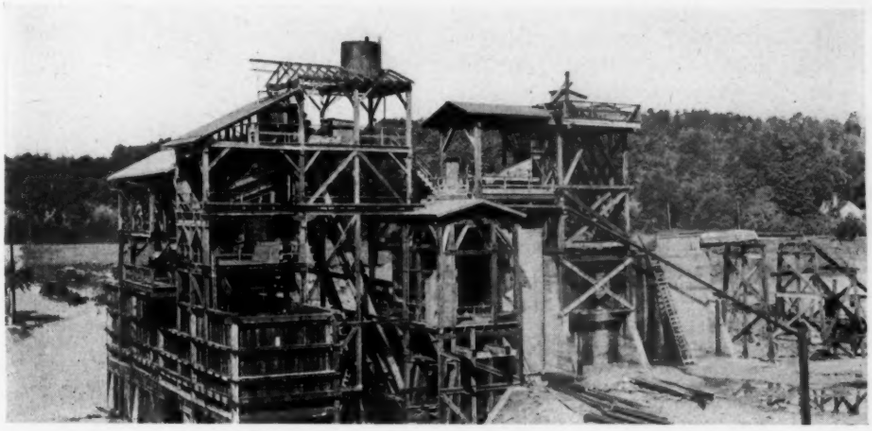


The 12-in. dredge pump and motor drive



Jets above one of the vibrating screens

Truck with crawler treads and bulldozer attachments and, at right, delivery truck at scales



Another view of plant, showing bins at left and dredge discharge at right

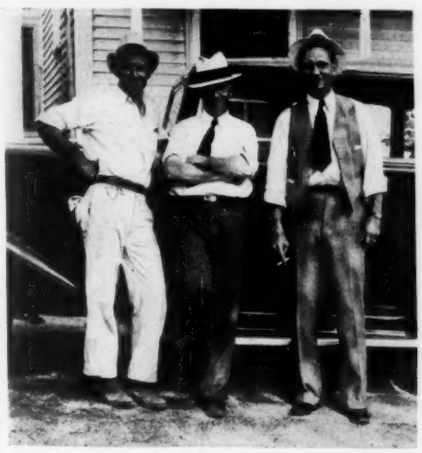
product, water is sprayed on the material at each screen through Binks "Spra-rite" nozzles, the water being supplied by an 8-in. Morris high-pressure pump.

Each machine in the plant is driven by a separate motor and the power is distributed through conduits from a central panel board of the unit type made by the Trumbull Electric Manufacturing Co. A recording ammeter makes a permanent record of the plant operation so that by referring to the charts the superintendent can determine the volume of material that has passed over the main screen during any given period.

The finished product is loaded directly from the bins to delivery trucks or is placed in storage by yard trucks. The fleet is composed entirely of Hug trucks and those used in storage service are equipped with crawler treads and bulldozer spreading attachment.

In order that crushed rock may be produced prior to the completion of the rock crushing unit a temporary connection has been made to the gravel plant so as to enable this unit to wash and screen rock as well as gravel. This is accomplished by delivering the quarried rock to a primary crusher located temporarily at one side of the gravel plant and by means of a belt conveyor passing the crusher product to a scalping vibrator. This in turn feeds its rejections to the 10-in. Newhouse crusher and the screenings to the boot of the Telsmith elevator. From this point the course of the rock through the plant is the same as that of the gravel from the dredge.

The plant was designed by the Allis-Chalmers Manufacturing Co. in collaboration with the Concrete Materials Co., and was erected by company forces under the direction of H. M. Cryder. The Morris pumps and Binks spray equipment are serviced by the Starkweather Engineering Co., Boston, Mass. The operating officials of the Concrete Materials Co. are: R. S. Wilson, Jr., general manager; W. F. Tracy, superintendent, and W. R. Carmichael, engineer of construction.



Left to right: W. F. Tracy, W. R. Carmichael and R. S. Wilson, Jr.

Mineral Resources of Massachusetts

MINERAL production of Massachusetts in 1928 amounted to $16,000,000, of which nonmetallic metals predominated, a report on the mineral resources of Massachusetts, issued by the Industrial Commission, states.

Stone constitutes approximately half the mineral production of the state. Its granite sales are larger in value than that of any other state. A rather comprehensive report on the granite industry is given. Other commercial production includes trap rock, largely for road material; limestone, both for the burning of lime and as aggregate; marble, of which there are said to be excellent deposits, may offer opportunity for greater development; and sand and gravel, which occurs in nearly all parts of the state.

Column Tests

THE Third and Fourth Progress Reports on Column Tests at Lehigh University, started by the late Willis A. Slater and Inge Lyse, have been issued by Lehigh University as Circular No. 81.

Feldspar

A REPORT on feldspar has been prepared by Hugh S. Spence and published by the Department of Mines of Canada. This is the only major report to have been published by that department since 1916.

This report incorporates the results of field work carried out from 1927-30 in the feldspar-producing districts of Canada and the United States. Notes are given on the principal feldspar-mining fields in the United States, and current milling practice is described. A bibliography of the more important articles and reports dealing with feldspar that have appeared in recent years is included in the report.

Rock Phosphate Industry and Outlook

By H. D. Ruhm
Consulting Engineer, Columbia, Tenn.

THE YEAR 1932 has seen the smallest volume of production and the lowest prices reached in the phosphate rock industry in a great many years. In the Tennessee field not over 200,000 tons have been shipped. Only one plant in the field, out of seven, has run with any regularity at all and that was only at small output of special product for furnace consumption.

This product is said to be run-of-mine and mud pond waste material nodulized in a refractory lined furnace, and is said to analyze from 55 to 60% B.P.L., with a large content of silica, iron and alumina. It should be very desirable for furnace production of phosphoric acid when briquetted with coke and sand.

The oil flotation process in operation in the southern part of the Tennessee field was started up again in October, 1932, after a long shut down and is said to be producing a very satisfactory product for acidulation, with a by-product for grinding for direct application.

A comparatively small tonnage of ground rock was produced for acidulation and very little was ground for direct application after the close of the spring season, as stocks on hand have more than cared for requirements of this branch of the industry.

The production of hand mined furnace lump has been practically all for one consumer and was supplied in the main by six or seven small contractors working in different parts of the field for the first six months and the last two months of 1932. During the other four months one large contractor was given the entire contract for rock which he mined from the Bear Creek section of the Tennessee field, north of Columbia.

Low Prices

The price of $3.75 to which 72% lump rock was cut by the small miners early in 1932, was reduced to $3.25 in July and still stands at that figure. As many tons have been shipped of a grade around 63%, the ton price received by shippers has been only $2.35, which is the price at which blue rock of 65% grade was being sold in 1896, when the Mt. Pleasant brown rock was discovered.

After the small miners had rested all summer with little or nothing to do, the single contractor who had shipped 17 or 18 cars per week for four months with practically no profit discontinued operations, and the small miners started in again about November 1 and about seven or eight of them have kept up about the same volume of shipments produced by the one.

It is now predicted that the price will receive a further cut to $3.00 per ton in January. Of course as long as phosphate owners can be found to sell lump rock at 20 to 50c, labor will work for 60 to 75c per day, and wood fuel for drying the rock can be had at $1.75 per cord, this state of things will continue, but at any time demand in other lines resumes, normal prices will of necessity, again prevail.

For the present it is really a godsend that the particular furnace producer of phosphoric acid is still able to keep running, as his consumption is the main dependence left to the suffering phosphate miners today.

Florida Conditions

Florida production is reported also very much curtailed; yet with a low freight rate Florida rock is moving to the Memphis, St. Louis and upper Mississippi Valley region. All Tennessee rock shipped by rail had a 12c per ton advance effective January, 1932, in the effort then made to help the railroads; but less has been moved out of Tennessee on this increased rate than has moved from Florida by the reduced rates, so the railroads have not experienced much benefit from the increased rates on phosphate rock.

Deposits Are Bought at Ridiculously Low Prices

As indication of the complete lack of confidence in phosphate properties for the time being on the part of investors, there have been several foreclosure sales of extensive deposits of good rock at absolutely ridiculous prices. One such tract of 280 acres was bid in at $1200 while another of 1500 acres went at $5000, in each case the mortgage holders taking in the property without any other bids being offered. Truly this can be termed "bargain time in Tennessee."

Western Fields

The western field of Montana, Idaho and Wyoming has shown a fair increase of production for the past two years, largely if not entirely due to the necessities of smelters in Montana and British Columbia to take care of their necessary by-product production of sulphuric acid, which is combined with phosphate rock to make superphosphate. In addition to the Anaconda mines, large developments have been made by William Anderson at Garrison, Mont., and a new organization is being developed to still further promote the sale of that output both in raw and manufactured state.

New Processes

Among new processes worked out for better recovering values from phosphate rock is one for treatment of low grade run of mines material with both sulphuric and hydrochloric acids, with complete recovery and reuse of the HCl and carrying the H_2SO_4 reaction to completion, in which a dry white powder in perfectly friable condition is produced, containing 20 to 26% (citrate soluble) P_2O_5 all in dicalcium phosphate form, said to be eminently suitable either as a fertilizer or for animal feeding.

It is claimed that only about 85% as much acid is required per ton in this process for making 26% citrate soluble as is required in the ordinary process to make 16% superphosphate, but no commercial operation has yet been conducted.

As a means of further cheapening the process, it is reported that common salt can be used as source of required HCl, and the resulting product will contain a mixture of sodium sulphate or salt cake, which is a desirable ingredient in many mineral mixtures. By using muriate of potash, the resulting product can be made to contain sulphate of potash for use in fertilizer mixtures. This process should find considerable favor with large producers of by-product sulphuric acid who use acidulation of phosphate rock as an outlet for this acid.

Progress in Use of Rock Phosphate

The outstanding report for 1932 of soil fertility experiments with phosphates, both superphosphate and rock, with and without lime and potash, is Bulletin No. 206, Oklahoma A. and M. College, by Dr. H. J. Harper, issued September, 1932. In this bulletin are shown some of the photographs taken by Dr. Harper, some of which were used to illustrate an article on this subject by the writer in the June 18, 1932, issue of Rock Products.

Assuming sweet clover as worth $10 per ton, manure $1 per ton, limestone to cost $1.50 per ton and 20% superphosphate and finely ground rock phosphate each $25 per ton, both of which latter figures are much above present selling prices, calculations have been made (by the writer based on yields given in this bulletin)

of the values of the increases secured over untreated lands by various treatments, during first season of application. These show that no iron-clad rule can be laid down absolutely establishing either form of phosphate as being the best to use in all cases even for first year results. Fifteen farms were involved and without treatment they averaged $3.77 per acre with maximum yield $9.34 per acre and minimum nothing.

The net value of maximum increase from any treatment was $30.46 per acre from 400 lb. of rock or lime phosphate and three tons of limestone at Stigler, Okla., where 400 lb. of 20% superphosphate and three tons of limestone yielded $14.92 net value.

The largest net value of increase from the use of superphosphate came at Checotah, where 200 lb. super, 3 tons limestone and 100 lb. potash netted $16.61 and at same place 400 lb. rock with same lime and potash netted only $7.27 but left 92 lb. more phosphoric acid for future crops. The greatest loss $15.11 was with 1000 lb. rock, 3 tons lime and 6 tons manure, at Chandler, where 200 lb. super and same lime and manure made $1.06.

Physical Properties and Weathering Characteristics of Slate

IN A RECENT ISSUE of the *Bureau of Standards Journal of Research,* D. W. Kessler and W. H. Sligh report on the physical properties and weathering characteristics of slate.

According to this report, tests on 343 samples of slate from the various districts gave the following average values: Modulus of rupture, 11,700 lb. per sq. in.; modulus of elasticity in flexure, 13,500,000 lb. per sq. in.; toughness, 0.192; abrasive hardness, (*Ha*) 7.6; absorption, 0.27% by weight; porosity, 0.88%; bulk density, 2.771; weight per cu. ft., 172.9 lb. The strength, elasticity and toughness values given above were obtained on oven-dried specimens tested in the strongest grain direction. Strength determinations on specimens that had been soaked in water for several days showed considerably lower values. The average ratio of the modulus of rupture of soaked specimens to that of dry specimens was 0.69.

The examination of a considerable number of slate shingles which had been in service for periods varying from 12 to 130 years indicated that slate deteriorates mainly from a combination of chemical and physical causes. Slates containing both pyrite and calcite in appreciable amounts are subject to decay due to the conversion of a part of the calcite to gypsum. The increase in molecular volume causes scaling of the surface. Slate shingles exposed on the roof decay more rapidly on the downward surface, which is probably due to the leaching and concentration of gypsum. A similar type of decay can be produced by alternately soaking and drying the slate. The slates which are more subject to this type of weathering can be disintegrated by 40 or 50 cycles of this treatment.

Frost may cause deterioration, but the rate of this action is very slow. Aside from chipping off the scales near the edges already loosened in the trimming process, frost plays a very minor part in slate weathering. However, the freezing of water between shingles which are nailed down tightly may cause breakage.

Influence of Added Substances on Hardening of Gypsum

GYPSUM CEMENT ($CaSO_4 \cdot \frac{1}{2}H_2O$) mixed with a solution of NaCl (1.01%), $(NH_4)_2SO_4$ (0.65%) or Na_2SO_4 (1.26%) hardened about twice as rapidly as with water, as measured by the temperature rise. Electrical conductivity measurements show three stages: (*A*) solution increases to a maximum; (*B*) solution of $CaSO_4 \cdot \frac{1}{2}H_2O$ and crystallization of $CaSO_4 \cdot 2H_2O$ compensate each other; (*C*) crystallization exceeds solution. Stage *A* is very short with some cements. Stage *B* is shortened by the added salts. The solvency of $CaSO_4 \cdot \frac{1}{2}H_2O$ in moles per kg. H_2O at 25 deg. (*S*) is: for H_2O, 0.05138; for NaCl solution, 0.07488; for $(NH_4)_2SO_4$ solution, 0.04904; for Na_2SO_4, 0.04902. The corresponding solubilities of $CaSO_4 \cdot 2H_2O$(N) are: 0.016, 0.026, 0.011, 0.010. $S - N$ is greater for all three salt solutions than for H_2O. The ratio $(S - N)/N$ is greater for $(NH_4)_2SO_4$ and Na_2SO_4 solutions than for H_2O, but is less for NaCl solution.—*Chemical Abstracts.*

Rate of Solution of Limestone Particles

THE RESULTS of tests of the relation between fineness of limestone particles and their rates of solution are given in an article by F. E. Bear, American Cyanamid Co., and L. Allen, Ohio State University, in the September issue of *Industrial and Engineering Chemistry.* This research was sponsored by the National Agricultural Limestone Products Association, Columbus, Ohio, and was carried on by L. B. Broughton, H. F. Kriege and the authors.

Two limestones were used, one high-calcium and the other dolomitic, the pulverized limestone being sieved to 14 different sizes ranging from 3-mesh to minus 200-mesh. The soil used had a pH value of 4.65 and a lime requirement of 2.75 lb. of calcium carbonate per 1000 lb. of soil.

Forty-eight unit plots were used and the limestone treatments thoroughly mixed with 200-lb. portions of soil.

The plots were sampled at intervals over a 4-year period and the decreases in soil activity were measured by the Jones method of lime requirement and by pH determinations, using the quinhydrone electrode.

The data indicated that practically ten times as much of the 4- to 6-mesh material was required as of the 48- to 65-mesh material for the same effect at the end of a 1-year period. Also, for the same effect at the end of the 2-year period, about eight times as much 4- to 6-mesh material was required as of the 48- to 65-mesh size.

According to the theory that the rates of solution of different sized particles of a given limestone are proportional to the exposed surfaces and that the diameters of all particles are reduced by equal amounts in any given time, the ratio between these two sizes for the same effect at complete solution of the 48- to 65-mesh material would be 5.6 : 1. It appears that the observed efficiency values for the finer sizes would fit the theoretical somewhere before the 2-year period, which agrees with the conclusions from the residual carbonate data that the standard 48- to 65-mesh size would be dissolved in 20.3 months.

The observed efficiency values for the coarser sizes, above 10-mesh, were relatively low, diffusion no doubt playing a greater role in the dissolution of the larger particles. This is evident when it is considered that the distance between the surfaces of 4- to 6-mesh particles would be 1.2 cm. if the particles were uniformly distributed through the soil and applied as in the experiments.

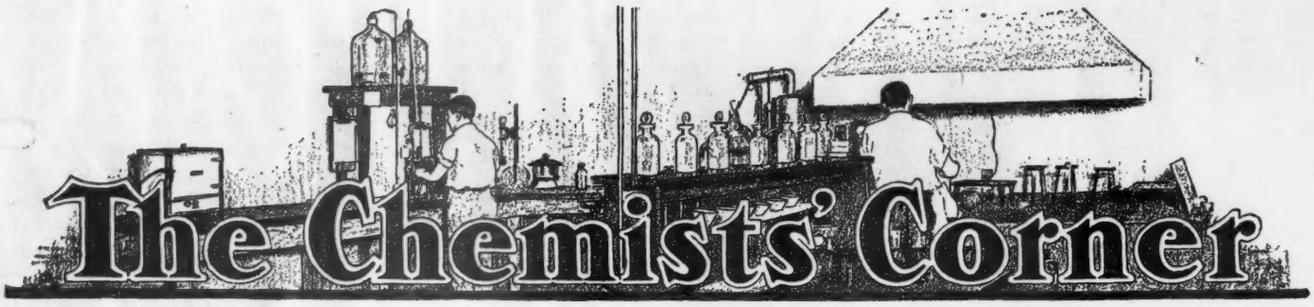
Imports of Phosphate Rock to the United States

ABOUT mid-October a cargo of phosphate rock from up near the Arctic Circle in Russia was unloaded in Baltimore. Presumably labor and exchange conditions and the cheapness of ocean freights make it possible to transport this material to the United States and sell it successfully in competition with our home production, Charles J. Brand, secretary and treasurer of the National Fertilizer Association, said in addressing its eighth annual convention.

When we recall that the known phosphate rock deposits of the United States are estimated to exceed eight billion tons, this situation should provoke deep thought, since conditions point to a continuation of these shipments throughout the winter, when rail shipments to Soviet agricultural lands are impossible.

It is also understood that shipments of phosphate rock from North African deposits may be renewed on a larger scale in the near future. The effect of these shipments on the American phosphate industry is of particular importance in view of the reduced consumption which has resulted from economic conditions of the immediate past.

This is one of a number of problems of vital importance to the industry which were discussed by Mr. Brand and reported in a recent issue of the *American Fertilizer.*



Can Cement Be Overground?

By L. R. Davies-Graham

Chief Chemist Goliath Portland Cement Co., Ltd., Railton, Tasmania

IT IS NEARLY three years since Prof. Hans Kuhl in "Cement and Cement Manufacture" gave the results of his grinding experiments and expressed the opinion that by overgrinding clinker, a portion of the cement strength was lost. Such a statement sounded like rank heresy to an orthodox cement manufacturer, since fine grinding has been regarded as one of the distinguishing characteristics of a high quality cement for such a long time.

When I saw Kuhl's first article I was quite skeptical and considered that by his long periods of grinding, up to 14 hours, he had completely dehydrated the gypsum and that it was the change in the form of the calcium sulphate rather than any alteration in grain size which was mostly responsible for the decrease in the strengths of his variout cements. Desiring to contest the opinion that cement could be ground excessively, and wishing to build up a case, the feed on our cement mill, which is a 3-compartment Smidth Unidan mill, was reduced until the residue was 2% on 180-mesh sieve, the normal residue being about 4.5% on this sieve.

This degree of grinding was maintained for some hours, the mill shell being cooled by means of water sprays. The door on the final chamber of the mill was then removed and samples taken from this compartment. Seventeen samples at distances of a foot apart were taken and placed in air-tight containers. Residues were determined on each sample and nine samples taken as being fairly representative of the material in the mill. On the chosen samples chemical analyses were made, and to my surprise it was found that the samples were practically identical in every respect, and the small variations in sulphuric anhydride and loss on ignition were well within the range of experimental error, and quite insufficient to cause any alteration in the quality of cement. This was point number one to Prof. Kuhl.

The usual physical tests according to the Australian specification were then carried out, and in order to challenge or prove Kuhl's assertion that the coarser cements were most favorable with higher water-cement ratios, briquettes according to the American standard specification were made, also concrete mixtures using 1:2:4 mix, and 2.75:1 plastic mortar blocks, using a W./C. ratio of 1.2 for the concrete and plastic blocks.

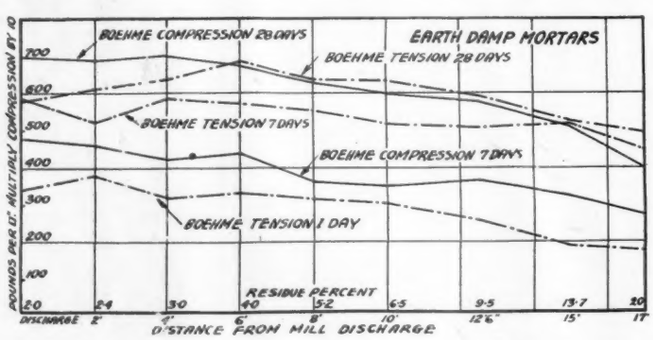
These results are given in Table 1, and to construct Table 2, the best result in each test, which has been marked in heavy type, has been called 100% and the other results have been calculated as a percentage of the best sample. These total points have then been added together to give the total number of points as shown in column (14), which figure may be regarded as a quantitative value of the cement under several different conditions.

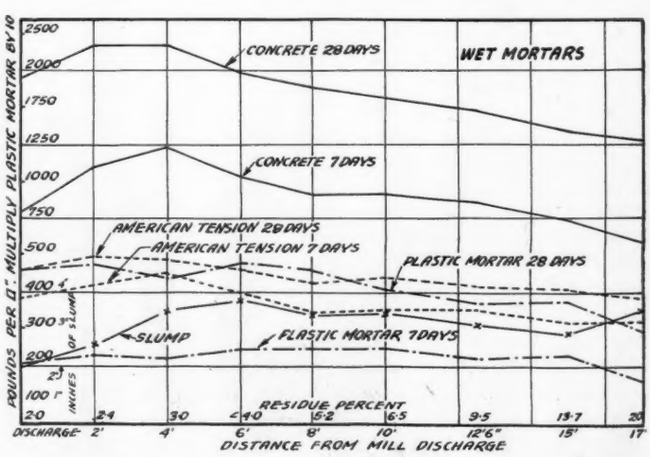
The mean chemical analysis of these several samples was as follows:

Free lime	0.83%
CaO	64.39%
SiO_2	21.60%
Al_2O_3	6.65%
Fe_2O_3	3.02%
SO_3	1.82%
Loss	1.05%
MgO	1.4 %

Discussion

For further clarity the strength results have been recorded in the form of graphs, and it is noticeable that the most desirable cement has a residue of about 3% and not finer than this. Generally speaking, the finer the cement the higher the early period strengths, but this is also true of high lime cements, which are high in free lime and show a retrogression in strength between 7 and 28 days. In the case of the Boehme hammer compression tests, there is certainly no tendency to show decrease in values as the degree of fineness increases. I am at a loss to explain this, but will say that many cement people doubt the value of this test as an indication of the concrete-making


EARTH DAMP MORTARS
BOEHME COMPRESSION 28 DAYS
BOEHME TENSION 28 DAYS
BOEHME TENSION 7 DAYS
BOEHME COMPRESSION 7 DAYS
BOEHME TENSION 1 DAY
POUNDS PER □" MULTIPLY COMPRESSION BY 10
RESIDUE PERCENT
DISTANCE FROM MILL DISCHARGE



Graphs showing tests of earth damp (left) and wet mortars (right) made from cement from different parts of the finish grind mill

properties of a cement. The preference seems to be for a more practical test, i.e., one in which a higher water-cement ratio is used, and it was for this reason that plastic mortor blocks were made, and the best block by this method was made from the cement 6 ft. from the end, which is relatively high at both 7 days and 28 days.

The concrete tests should be a true indication of what is required in cement strength, for these are the conditions under which the cement is to be used. In this instance there is not the least doubt that the sample taken 4 ft. from the mill discharge is most suitable. On the graphs it will be seen that the curves are moderately flat on top, showing a gradual decrease as the cement becomes coarser, but the line is rather more steep as the cement is "overground," so that it is preferable to keep the cement slightly coarse. The term "overground" is used quite deliberately, and an attempt will be made to show that such a term is correct.

Observation of the slump line will make this very apparent. One expects the normal consistency to increase inversely as the grinding, and this fact applies also to the slump, viz., the coarser the grinding, within limits, the greater the slump for a given water-cement ratio. It will be seen that although the residue is slightly decreased during the last few feet in the mill, the amount of flour finer than 30 microns is practically unaffected, though it is quite feasible to suppose that the percentage of flour below, say, 10 or 15 microns may have been substantially increased.

Theory

Kuhl (1) advances the theory that early strength is due to the formation of large quantities of gel, and later strengths are due to the desiccation of this gel, the drying being brought about by absorption of the moisture from the gel, by the coarse particles in the cement. This may be so, but on the other hand several very finely ground cements have excellent improvements in strength between 1 day and 28 days.

It may be that it is essential for the individual particles to be graded in size much as the metal and sand in a concrete mix are graded, and that some super fine cements do possess this grading in spite of the residue being finer. I am sure nobody would suggest that fine grinding is not an advantage.

Jennings (2) in Australia has done work on different sized particles from 44-micron downwards, and definitely shows that the early strengths improve with decrease in size of cement grains. His figures show that the finer grains also give better strengths at 28 days, and since his grains would all be of similar size, this challenges Kuhl's theory that larger grains are necessary to absorb the water from the gel, thus showing an increase in strength with age.

Weisberger (3) claims that Kuhl's results have been obtained by using greater quantities of mixing water for the finer samples, since the amount of water required for normal consistency increases rapidly with finer grinding. This is true, as my figures show, but when using both fine and coarse cements in concrete mixtures, with a constant W./C. ratio, the coarser cements showed increased strengths and higher slumps, which seems a fitting reply to this statement.

I think it was Helbig (4) who suggested that the results obtained by Kuhl were due to hydration of the finer particles, but in my case the experiments were conducted on the plant mill, and can barely be called laboratory experiments.

If a cement mill be allowed to overheat and flakiness results, then even though the material be excessively fine, there is a reduction in strength of the cement, and the explanation is offered that the gypsum has been dehydrated. This may or may not be, but I have seen burnt plaster used commercially in place of gypsum with quite good results, and experiments using normally and dead burnt plaster do not indicate any loss of strength due to this cause.

Koyanagi (5), as a result of a series of experiments, says "possibly the retarding action of gypsum is in some way reduced by long grinding in contact with the clinker." A very indefinite statement, certainly, but I subscribe to this view. Grinding experiments by this worker show that a relatively coarse cement ground for a long time in contact with gypsum was quicker setting than a finer sample of the same clinker to which finely ground gypsum had been added after the grinding of the clinker. In like manner I have found that the addition of ground gypsum to separately ground clinker made a cement which was better when tested in the laboratory for tensile or compression tests, and a superior concrete also resulted from the same cement.

I would like to leave it at that in the hope that some other inquirer may have further knowledge to impart on this interesting subject.

References

(1) *Cement and Cement Manufacture* (March, 1931).

(2) *Cement and Cement Manufacture* (March, 1932).

(3) *Tonindustrie Zeitung*, Vol. 55, 1931.

(4) Rock Products, May 9, 1931.

(5) *Zement*, Vol. 20, 1931.

TABLE 1—TESTS OF CEMENT FROM SAMPLES AT VARIOUS POINTS IN FINISH GRINDING MILL

Sample—Distance from mill discharge	Residue plus 180-mesh	Tension—Boehme briquettes 1 d.	7 d.	28 d.	Compression (Boehme) 7 d.	28 d.	American tension 7 d.	28 d.	Compression plastic mortar blocks 7 d.	28 d.	Concrete 7 d.	28 d.	Normal consistency	Slump of concrete	Cement details Flour, 30 micron	Loss on ignition	SO_3
Very end	2.0	339	588	576	4690	7000	387	454	2005	4582	798	1940	26.75	2 in.	59.1	0.93	1.89
From discharge																	
2 ft.	2.4	374	522	604	4540	6875	416	494	2205	4758	1111	2170	26.75	2½ in.	59.0	1.05	1.78
4 ft.	3.0	312	580	637	4060	7000	452	491	2115	4406	1254	2170	26.5	3½ in.	58.9	1.07	1.82
6 ft.	4.0	330	568	681	4360	6750	399	469	2467	4771	1026	1985	26.0	3¾ in.	57.9	1.03	1.825
8 ft.	5.2	307	554	634	3750	6375	348	426	2467	4583	912	1885	25.75	3½ in.	56.8	1.04	1.81
10 ft.	6.5	296	514	639	3420	6000	349	444	2430	4053	912	1825	25.75	3½ in.	55.2	1.05	1.80
12 ft. 6 in.	9.5	258	507	598	3580	5750	347	419	2203	3701	855	1485	25.0	3 in.	53.5	1.11	1.82
15 ft.	13.7	183	517	512	3120	5125	320	413	2291	3725	741	1335	24.5	2¾ in.	50.8	1.06	1.8
17 ft.	20.0	171	446	492	2660	4000	320	384	1586	2850	570	1270	23.5	3¼ in.	45.4	1.14	1.79

TABLE 2—TEST DATA FROM TABLE 1 REDUCED TO PERCENTAGES

Sample—Distance from mill discharge (1)	Residue plus 180-mesh (2)	Tension—Boehme briquettes 1 d. (3)	7 d. (4)	28 d. (5)	Compression (Boehme) 7 d. (6)	28 d. (7)	American tension 7 d. (8)	28 d. (9)	Plastic mortar blocks 7 d. (10)	28 d. (11)	Concrete 7 d. (12)	28 d. (13)	Total (14)	Number of tests At 100%	Above 95%	Above 90%
Very end	2.0	90.6	100.0	84.5	100.0	100.0	85.5	92.0	83.0	96.0	63.5	89.5	975	3	4	6
2 ft. from discharge	2.4	100.0	88.8	88.5	94.7	98.0	91.6	100.0	89.1	99.6	88.6	100.0	1030	3	5	7
4 ft. from discharge	3.0	83.5	98.5	93.5	84.7	100.0	100.0	99.5	85.5	92.5	100.0	100.0	1029	4	6	8
6 ft. from discharge	4.0	88.5	96.5	100.0	91.0	96.4	88.2	95.0	100.0	100.0	81.6	91.5	1019	2	5	8
8 ft. from discharge	5.2	82.0	97.5	93.0	82.5	91.0	77.0	86.0	100.0	94.0	73.0	87.0	953	..	1	5
10 ft. from discharge	6.5	79.0	88.5	93.0	73.0	85.0	77.0	90.0	98.3	85.0	73.0	84.0	927	1	1	3
12 ft. 6 in. from disch'ge	9.5	69.0	86.0	85.5	76.0	81.5	77.0	85.0	89.0	78.0	67.0	68.5	854	..	..	..
15 ft. from discharge	13.7	49.0	88.0	75.1	66.5	73.2	70.6	83.7	92.1	78.0	59.0	61.5	739	..	..	..
17 ft. from discharge	20.0	45.7	75.7	72.1	56.7	57.0	70.6	77.7	64.25	59.6	45.4	58.5	677	..	..	..

Hints and Helps for Superintendents

Electric Welded Steel Plate Construction versus Cast Iron Construction*

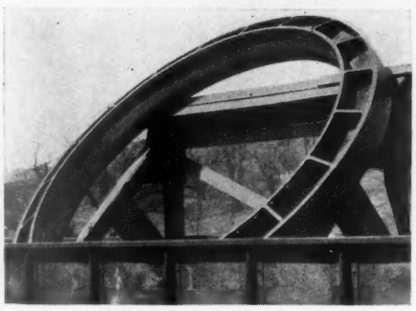
By R. N. Conrad
Traylor Engineering and Manufacturing Co., Allentown, Penn.

A COMPARISON of the cost and value of electric welded steel plate construction versus cast iron for a stiffener ring of a rotary kiln shell is of interest. Stiffener rings are placed on kiln shells where the distance between supporting tires are of minimum tolerances, which would cause a shell of large diameter to weave and become out of round. A properly designed ring placed midway between centers of supporting tires will hold the shell round and rigid.

Rings of this character have been made of cast iron and a welded steel ring was designed for this purpose for a particular kiln which is 11 ft. 3 in. in diameter and 160 ft. long. The details of design are shown in the accompanying illustrations. The outside ring, 14 ft. in diameter with a 12-in. face made with 2-in. plate steel, is rolled into halves with joints beveled approximately 30 deg., 1½ in. deep. The two halves were then butted and electric welded. This method eliminates spreading or receding of the ring beyond any desirable diameter.

The inside ring is made in a similar manner but with a diameter 11 ft. 9¼ in. and 18 in. wide. The center web is made of 1¼-in. plate steel in four segments cut to size and butt electric welded with one deep weld of ⅜ in. Fleetweld wire and a top and bottom flush weld.

The inside ring or bore is formed and



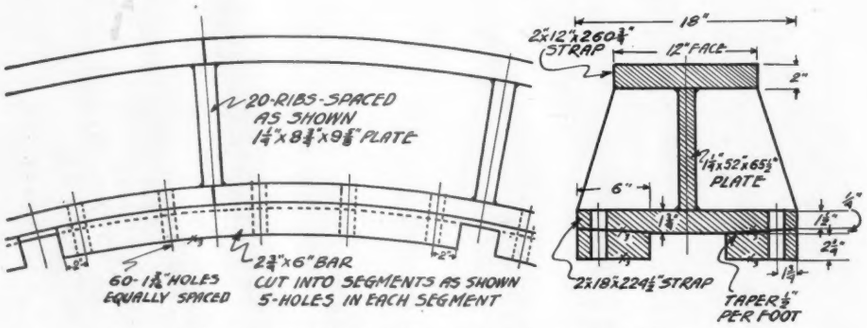
Completed stiffener ring

electric welded and to this the center web is spot welded. The outside ring is then spot welded to the center web, after which the center web is butt welded to both the outside and inside rings. The ring is true to form and only ½-in. finish is allowed in diameter bore for machine fit.

The stiffener ring is electric welded with form type welder, current range 90 to 750 a Lincoln "Stable-Arc" 600-ampere N. E. M. A. rated two operator, stationary plat- amperes, 30-hp. motor with operation on a 220-volt, 3-phase, 60-cycle power supply, using ⅜-in. and 5/16-in. diameter Fleetweld wire entirely. Amperage averaged from 550 to 700 in the welding of this ring.

Accurate costs were kept on the cost of this electric welded construction and compared with the cost of cast iron. This showed that the total cost of the electric welded steel plate constructed stiffener ring was $344.01, while the total cost of the cast iron construction was $430.15, giving a saving of $87.14 by using the welded type of ring. The ultimate stress in the cast iron in tension is 20,000 lb., while the structural steel ring has an ultimate stress of 60,000 lb., so that a ring with three times greater strength is obtained at a considerable saving in cost.

*A paper submitted for the second Lincoln Arc Welding Prize Competition sponsored by the Lincoln Electric Co., Cleveland, Ohio.



Design details of stiffener ring for rotary kiln

Welds Scalping Screen to Increase Life

AT THE PLANT of the Western Sand and Gravel Co. at Spring Valley, Ill., a double-deck vibrating screen is used for a scalper and for preliminary sizing of the material.

It was found that the stone that fell on the top deck of this screen broke the welded joints at the lower corners of the screen surface and eventually knocked off the end cross wire of the screen, causing the mesh to "ravel" if not attended to at once.

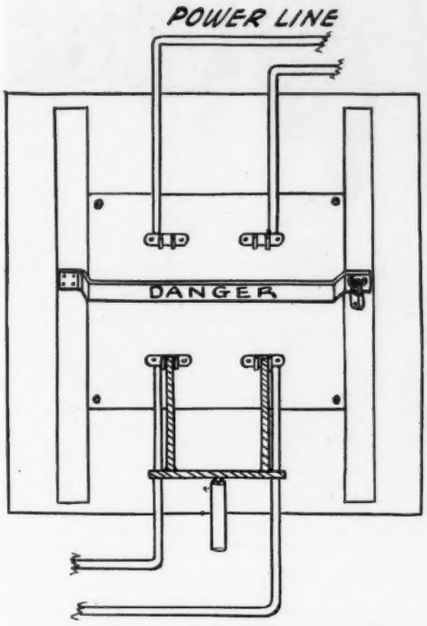
Welding lower strand saves screen

Holding the bottom wire in place was the key to the problem. There were 10 joints across the bottom of the screen so these were all welded. The result was a tight end on the screen which did not show the least signs of raveling and gave much longer service. So successful was the first screen welded in this manner that whenever the screening surface needs replacing the new screen is welded before it is put into use.

Safety Switch

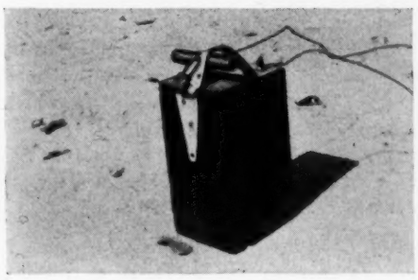
By Dare Paris
Monrovia, Calif.

WHEN electric blasting caps are being connected it should be arranged that only one man can fire the shot. If a blasting machine is being used it should be equipped with a lock as shown. The powder man should know that the current either unintentionally or maliciously cannot be applied while the connections are being made.



Mechanics can insure their safety

With a power line there should be some protective device which would make it impossible for the switch to be thrown until the proper time. The firing switch, illustrated, is very effective for this purpose. The cross piece marked "danger" can be locked in place and only removed with a key which is in possession of the powder man.



Prohibits careless firing

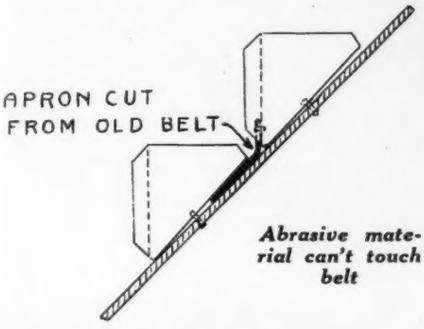
Reducing Wear on Elevator Belts

WHERE BUCKETS are fixed to rubber belts for elevating crushed stone or other materials possessing marked abrasive qualities, fragments are apt to lodge between the bucket and the belting as the bucket passes over the bottom pulley. Such sharp, angular pieces tend to gouge the belt when pressed by the return of the bucket to its normal position.

Damage to the belt can be minimized by fastening aprons cut from discarded belting to the outside lower part of each bucket with small bolts. The apron is tucked down between the next bucket and the belt. Should stone fragments lodge in this space the wear is upon the apron rather than upon the new belt surface.

In the accompanying illustration is shown the method used by C. A. Cross, superintendent of the M. J. Grove Lime Co.'s plant at Stephens City, Va.

Mr. Cross further safeguards his elevator belts by using wing type pulleys at the bottom of the elevators. With a solid pulley, rocks may fall between the belt and the pulley, causing the belt to be thrown off or damaged or wrenching the bearings unnecessarily. With the wing type pulley, which is on the order of a paddle wheel, rocks fall between the wings and are thrown aside harmlessly.

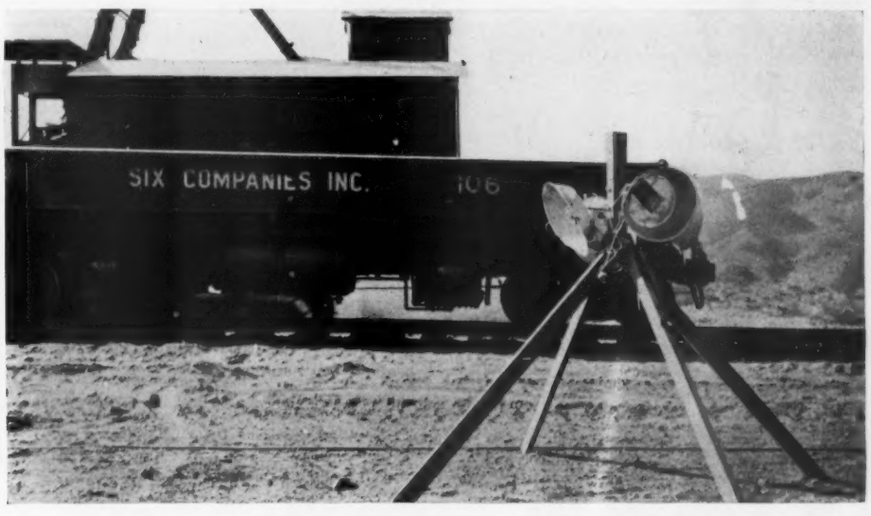


Abrasive material can't touch belt

Flood Lights

ONE very prominent thing at the site of the Hoover dam, now under construction, is the abundance of lights everywhere for night work. Each light is provided with a reflector (home-made) which consists of a bright metal stew pan roughly 16-in. in diameter with the light socket fixed to the centers so that the pan acts as a reflector. Plants which operate infrequently at night might find such a light cluster desirable, and its cost is negligible.

At the pit which supplies the sand and gravel, which is 7 mi. from the plant, night work is the rule so that several of the flood lights of the type shown are used. Three reflectors are fastened to a simple tripod. Sufficient of these tripods and light clusters are available to amply light the working area at the pit during the night shifts.



Portable stand with cluster of reflectors illuminates in all directions

Preventing Segregation While Loading Cars

LOADING to railroad cars is done through a swinging cylindrical chute at one rock products plant and the chute is kept constantly moving while loading to eliminate segregation as far as possible.

The chute has two handles made of 2-in. pipe bolted to its sides which are used to direct the flow of material as desired. However, the chute with the material passing through it is quite heavy and unwieldy to move. It is especially difficult when loading first starts, for then the bottom of the chute is just about on a level with the loader's head and it is difficult to apply the weight of the body in moving the chute.

Swinging spout has handles

The man shown in the illustration is getting around this difficulty by pushing with his head, protected by a football helmet. This method of loading is said to have entirely eliminated segregation. The helmet also protects the worker from falling stone.

Preventing Wear on a Quarry Skip

AT THE QUARRY of the Edward Hely Stone Co., Cape Girardeau, Mo., a large double counter-balanced skip hoist is used to raise the stone from the quarry floor to the plant. The two cars of this skip hoist weigh 7 tons each, being of heavy steel construction. However, each load brought to the plant contains about 10 tons of stone, so that it can be seen that the cars are subject to hard service.

As the quarry stone is dumped to the skip cars the impact on the sides of the car is so great that the lower side bulges from the shock in spite of the heavy construction of the cars.

To prevent this the company fastened a wearing surface of railroad rails to the side of the skip car which receives the impact. The result has been entirely satisfactory as far as keeping the side from bulging, and it has also prevented wear on the side of the skip car.

The force of the impact is shown by the way a number of rails have been broken while in use on the skips.

Modernization of Storage Bins

BATCHER BINS are essential at most plants supplying aggregates today. Sometimes small portable bins are most economical. In other cases economical handling requires that existing bins be equipped for batching. Such was the case at a western sand and gravel plant. After considerable study the method shown was determined as the best way to install this batcher. The central runway was excavated to a depth sufficient to provide ample head room and 12 in. concrete retaining walls were poured. Johnson batcher bins were then raised into place. Trucks as well as transit mixers are now readily loaded from these bins.

Assures better lubrication with less care than hand oiling provides

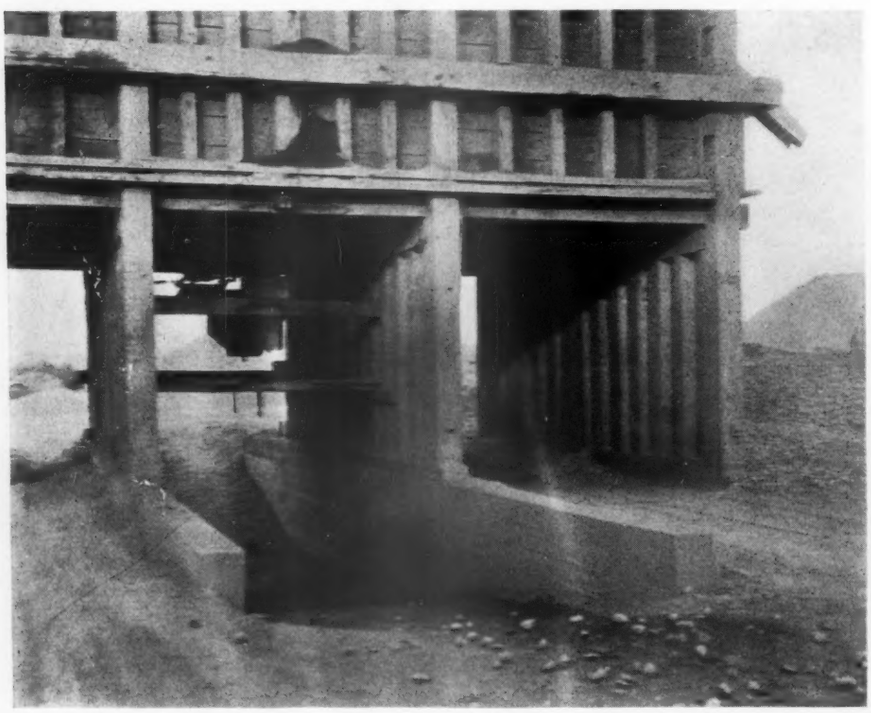
Gear Lubricators

ON the western desert, lubrication of open gear equipment is quite a problem owing to the silt and sand that is blown into the equipment. Proper and continuous lubrication of gears is essential to continuous operation. At the sand and gravel plant of the Six Companies, Inc., at Junction City, Nev., which is supplying aggregate for the Hoover dam, lubricators of the design shown are used in many places.

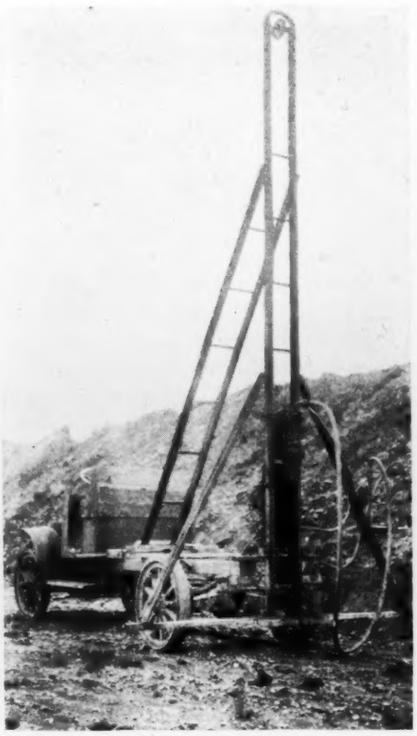
These are made of a piece of 4-in. pipe, with the ends closed by welding, and a ¼-in. outlet pipe controlled by a valve. The device is filled through a 1½-in. plug at the top. When filled the oil is allowed to drop slowly to the wearing surface. Lower power consumption and longer life of the gears or bearing surfaces are assured by the use of such a device.

Rock Drill on Auto Chassis

A ROCK drill, mounted on the chassis of a light automobile, has been found to be a great convenience at the quarry of the Pontiac Stone Co. of Pontiac, Ill. It permits quick and easy movement of the drill from one part of the quarry to another and a much greater flexibility of operation than



Batching bins make this plant delivery system modern



Makes own portable drill

Fines are carried away by pipe at left

is possible with a drill not mounted in this way, the operators state.

Removing Excess Fines from the Dredge Discharge

AT THE PLANT of the Kingston Lake Gravel Co., at Mapleton, Ill., the discharge from the dredge pump is delivered to a large stationary screen at the top of the plant. This discharge contains a considerable amount of fine material, as the pit which the company is working has a high percentage of fines. However, it is not desirable to run all of these fines through the plant as there is demand for only a small portion of what could be produced.

To get rid of this fine material the company has installed another pipe opposite the end of the discharge pipe and about a foot away from it. This second pipe is placed higher than the discharge pipe, so that its lower half is in line with the upper half of the discharge pipe. Then, as the water and gravel is discharged from the dredge pipe, the upper portion of the stream is caught by the second pipe and wasted. Only fines are caught by the second pipe, as the larger and heavier pieces are carried in the lower half of the dredge pipe and fall to the screen below. The device has worked very effectively at this plant.

Keeping Conveyor Belts Free

SAND AND PEBBLES which collect gradually on the inside of conveyor belts sometimes cause excess wear. This trouble can be overcome by placing a scraper board in contact with the inside of the belt somewhere along the return portion.

A 2x4-in. or 2x6-in. timber should be used for this purpose and should be so installed that it just comes in contact with the inner surface of the belt. The piece should be placed midway between two return idlers which are fairly close together so that the contact will be kept the same between belt and board at all times. If the board is placed across the framework at a sharp angle the material will be scraped off the inner surface of the belt and dropped to the ground at one side.

Cleaning Gravel While Loading

AN IMPROVEMENT over most cleaning devices in use on loading chutes has been installed by the Estill Springs Sand and Gravel Co. at its plant in Estill Springs, Tenn.

A perforated plate is placed on the bottom of the loading chute. A second chute is built to catch the fines that pass through this plate and carry them to a pile so they will not cover the rail below. This is an incentive for good housekeeping.

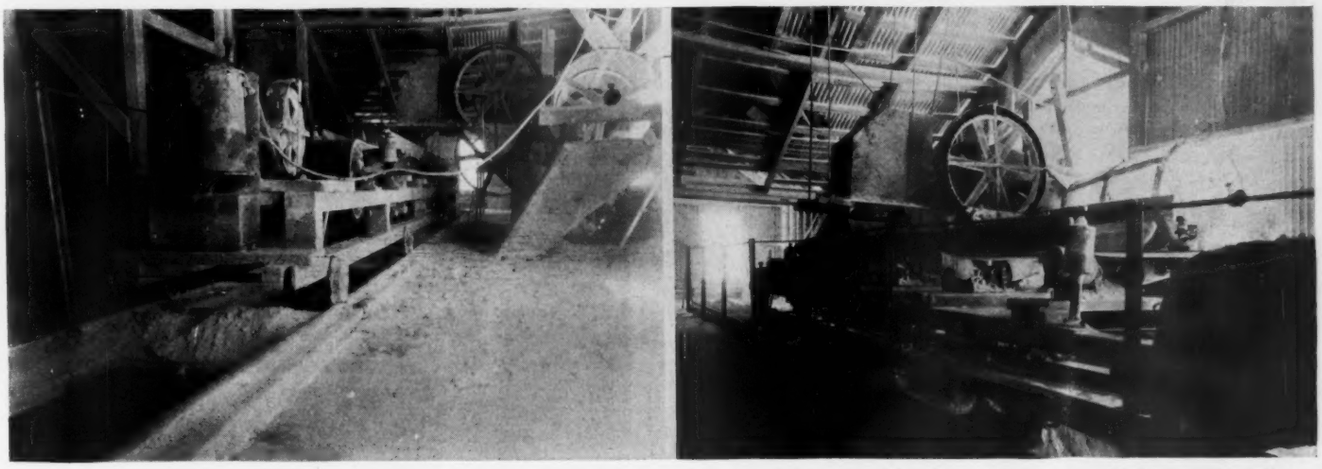
In addition to this simple screening, nozzles have been placed all along the loading chute and the material is thus given a final cleaning as it leaves the plant.

Shuttle Conveyor Installation of Novel Design

AT THE OLD PLANT of the Standard Gypsum Co. at Ludwig, Nev. (now closed), the crushed gypsum rock was delivered to bins over the Raymond mills by a belt conveyor that served a cross-screw conveyor. Although it served the mill for several years, the screw was replaced with the shuttle conveyor shown and thereafter that part of the mill was forgotten as far as breakdowns or delays were concerned.

The shuttle is mounted on car wheels (three shafts and six wheels) which are distributed along its length to evenly divide the load. The wood frame above the wheels is of simple construction. The 16-in. belt that rides the conveyor is driven by a small motor mounted on the shuttle. The shuttle is hand-set.

There is nothing about the entire device that a mill mechanic could not make and assemble. In this case all of the metal parts were salvaged from the scrap heap.



This inexpensive shuttle conveyor was more convenient and caused less trouble than the screw which it replaced

Rock Products Clinic

Plotting Sieve Tests of Aggregates

THE EDITOR: I have been reading with interest your recent articles on "Plotting Sieve Tests of Aggregates." This subject is of great interest to us since for the last three years we have been issuing all of our specifications in graphic form.

In Part I of your articles you mention two mathematical quantities with which I am unfamiliar; namely, "mean effective particle size" and "coefficient of uniformity." This company confines its practice to bituminous pavements and although probably these mathematical conceptions are familiar to portland cement concrete engineers they are not known to me personally. I would much appreciate references to literature where I could find an exposition of the derivation of these quantities. It is quite possible that "mean effective particle size" would bear some definite relation to our quantity "bitumen index." This quantity is merely the weight of bitumen per square centimeter of superficial area of aggregate required by different types of bituminous pavements. The finer the grading the smaller the bitumen index is the rule in use, but our charts for the selection of this quantity are cumbersome and I am looking for a method of simplifying it. Any assistance you can give me will be appreciated.

A. R. EBBERTS
Technical Director, Colprovia Roads, Inc.

Editor Shaw's Reply

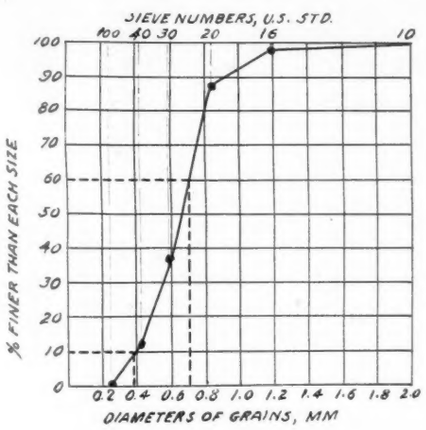
Replying to your letter regarding the "mean effective size" and "coefficient of uniformity" of sands, these terms are no longer written into specifications for concrete sands, although they were sometimes so written ten or fifteen years ago. Such specifications called for a coefficient of uniformity not less than 4, to make sure that the grains were not too nearly of one size.

But at the present time the only specifications of which I know that use these terms are those for filter sands and blast sands. The buyers of these would like to have a series of products running from fine to coarse, but with the grains of each product uniformly of the same size. Since this is commercially impossible they get as near to these products as they can by specifying the mean effective size and coefficient of uniformity.

The terms are thus defined in a leaflet, "Requirements for Filter Sands," issued in note book size by the National Sand and Gravel Association:

"The 'effective size' (also called mean effective size) is that size than which 10% of the sand is finer and 90% is coarser. It is expressed in millimeters and may be found by making a sieve analysis of the sand and determining the theoretical size of the screen through which 10% of the sand will pass. The 'uniformity coefficient' is the ratio of the size than which 60% of the sand is finer, to the 'effective size.' It will be seen that if all the grains are of the same size, the 'uniformity coefficient' will be 1."

These functions are always found by the graphical method illustrated by the accompanying sketch. The sieve analysis is made with the usual sieves, except that it is customary to use more of them than are in the series for finding the fineness modulus. But



Plotting sieve tests

the plot is made on a millimeter scale, as shown. The effective size and the size than which 60% is finer are read off at once, as is indicated by the heavy dotted lines. In this case the effective size is 0.39 mm. and the size than which 60% is finer is 0.71. The uniformity coefficient is therefore 0.71/0.39 or 1.82.

The sketch is redrawn from the leaflet mentioned.

Regarding the relation of the coefficient of uniformity to the bitumen index, I think that it would vary too much with the shape and surface texture of the grains to be of much use. The difficulty with it is the same as with other functions found from the sieve analysis, that the sieve analysis only roughly indicates the percentage of voids and the surface area.

At the same time I believe that any thorough study of sands for use in concrete or bituminous mixtures, or for any other use in which the grading is important, should include determinations of the effective size and coefficient of uniformity. A study of these might sometimes show a reason for an otherwise unexplained behavior.

EDMUND SHAW.

"The Industrial Sand Cases 1930"

THE EDITOR: Late in the fall of the year of 1929 certain producers and groups of receivers put in issue before the Interstate Commerce Commission the question of the rates on sand between all points in that portion of the country lying east of the Mississippi river and north of the Ohio and Potomac rivers, which territory is referred to in transportation circles as official classification territory.

This proceeding was designated by the Interstate Commerce Commission as Docket No. 22907, "The Industrial Sand Cases 1930," and hearings were held before a special examiner of the Interstate Commerce Commission beginning in September, 1930, and again in the early part of January, 1931. Final arguments were made before the commission by the parties in interest in January, 1932, and the final report in the proceedings was entered by the Interstate Commerce Commission October 4, 1932, or approximately three years after the institution of the original complaint.

Briefly the commission was asked to determine:

(1) A reasonable rate level for the transportation of sand between points in official classification territory.

(2) A uniform classification or description to be used in conjunction with the rate scale.

(3) That if it was determined to be a reasonable practice and warranted distinctive classifications of sand, that rates be determined for the common or basic varieties and that the rates for the other varieties of sand be related thereto.

(4) The prescription of a uniform basis for the determination of distances.

(5) To evolve a reasonable and practicable formula for the purpose of establishing grouped points of production and grouped destinations.

A uniform method of determining distances for rate application purposes was prescribed, it being the "shortest routes over which carload traffic can be moved without the transfer of lading," and as to the question of groupings this was left open, the carriers being left free to their own devices in the first instance.

As concerns the descriptions, the classification and the rate level, the associated interests prosecuting the issue are little short of dumbfounded.

This report, as the title thereof would indicate, proposes first a broad distinction in the rates on sand making for such purpose the division as between common sand, i.e., "sand primarily suitable and used for the fine aggregate in concrete for road and building construction" on the one hand and

"industrial sand, i.e., which is sand primarily adapted and used for glass making and for molding, abrasive, fire and furnace and filter purposes" on the other hand.

This is the major distinction as between the two groups. No attempt was made by the Interstate Commerce Commission to determine what a reasonable rate level would be as to the common sand traffic and to relate the industrial sand rates thereto, although they take cognizance of the fact that such a point was in issue, stating:

The principal dispute concerns the measure of the rates and the extent, if any, to which higher rates on industrial sand than on common sand are justified by transportation conditions.

On the contrary rates on industrial sand were made percentage of the first class rates which have been established by the commission for application within the territory involved, although this has not been and is not a railroad rate-making practice where the carriers are able to exercise their own judgment.

Bearing in mind the distinction as between "common sand" and "industrial sand" the commission made, this agency then embarked upon a further series of experimentation and established three groups of industrial sand classifications, to wit:

I. Ground or pulverized sand, silica, clay, flint and tripoli, in carloads.

II. All sand (except ground and pulverized sand), in box cars.

III. High silica sand (containing not less than 95% silica), in open-top cars.

Molding (naturally bonded) sand, in open-top cars.

Core sand, in open-top cars.

Other sand, in open-top cars from Michigan City and Willow Creek, Ind., Bridgeman, Sawyer and Muskegon, Mich., Barr, Bedford, Dundee, Geauga Lake, Massillon, Phalanx and Warwick, Ohio, and Polk, Schollard and Utica, Penn.

It is well here to bear in mind that in many, many instances rates as now published apply on sand without qualification and therefore apply on all of the foregoing types, including common sand, and that the effect of this order is to establish a refinement in these rates a practice which may politely be termed unusual. In fact in the majority of instances freight rates apply to generic designations of commodities rather than to the components thereof. And thus a railroad practice of many years standing is overturned and discarded.

Even more "stunning" are the scales of "reasonable maximum rates" which have been evolved, of which the following are typical:

In many instances, particularly in connection with Scales I and II, existing rates are more than doubled, which means that the industries compelled to use these materials in the face of a declining commodity market are called upon to bear a substantial increase in the cost of their basic materials in spite of a rather positive showing that the consuming industries were not in a position to assume any such burden.

BASIS OF FREIGHT RATES PRESCRIBED

Miles	Scale I	Scale II	ScaleIII
5	100	80	80
10	100	100	80
15	120	100	80
25	120	100	100
50	160	120	120
75	180	140	140
100	200	160	140
125	220	180	160
150	240	200	180
175	240	200	180
200	260	220	180
300	300	260	220
400	340	280	260
500	380	320	280
600	440	380	340
700	480	400	360
800	500	420	380
900	540	440	400
1000	580	460	420
1100	620	480	440
1200	660	500	460
1300	700	520	480

Scale I rates are 17½% of first class, Scale II, 14½% and Scale III, 13%.

Ground sand is largely used in the ceramic arts in the manufacture of pottery and white ware. The rates prescribed on this traffic are those shown under Column I; from a certain origin to points in the Chicago district to which the present rate is 113 c. per ton the new rate would be 220 c. per net ton were this basis to become effective.

Although the railroads in the course of the hearing expressed the opinion that they would have no difficulty in doing so, it is hard for an experienced sand man to anticipate by what means they hope to be able to determine whether a shipment of high silica sand is 95% in its silica content.

Certain receivers of sand due to plant facilities are able to use sand when received in box cars only; it is to be observed in connection with the prescribed scales that box car receivers will incur a penalty in contrast with receivers who obtain their material in open-top equipment, although there may be no difference in the sand, the railroad service or other elements which ordinarily figure in rate distinctions.

Sounding the warning, this is not a theory but a condition which confronts the rock products industry—this basis of rates so far as sand is concerned has been ordered, is to be made effective February 1, 1933.

We may anticipate that if in the case of such a low grade traffic as "industrial sand" such refinements are ordered, that other rock product industries will have their rates subjected to a like refining process.

Certain receiving and shipping groups are not in accord with the findings and orders which have been entered in this proceeding. Meetings have been held, others are contemplated in which the sentiment is crystallized and the best ways and means are being discussed to have this order modified: (1) by reopening the case, (2) by a reargument of its deficiencies, and (3) by a general modification of its provisions.

Industrial sand users and producers should acquaint themselves with the full import of this decision so far as it affects the rates they now enjoy and institute those measures which in their minds will best serve to safeguard their interests.

R. E. Riley, Traffic Director,
Illinois Silica Sand Traffic Bureau.

Thank You, Mr. Hanauer, for Your Encouragement!

THE EDITOR: Possibly you will not object to a sincere compliment on a cold morning such as this December 16, 1932, morning. Your editorial in the December 10 issue of Rock Products touched upon a particular point, the tremendous importance of which is palpably unrealized. The third paragraph of your editorial touched upon fact which ought to be indelibly carved upon every economics classroom wall of the western world. For this you deserve high compliment and encouragement in your views.

With particular faith and with a goodly share of rank superstition, we believe and teach our young such "laws" and doctrines as the "law" of supply and demand, the "law" of diminishing returns, competition is the life of trade, etc., etc., and we are minded to conjure with these and like conclusions to the detriment and criminal neglect of real scientific economic progress.

It strikes one like the "law" of wild horses—"wild horses are always wild horses"; but fortunately in this case we take the bull by the horns and tame wild horses. The "law" of wild horses is, therefore, no obstacle to our use of horses for our economic purposes.

In the matter of our economic laws, however, we are somewhat superstitiously faithful to them and worship them as governing gods in our economic scheme. This attitude and our mental lethargy on the subject of political economy has robbed our United States from its just place as a leader in the march of progress of western civilization and given us the present picture of want, suffering and inability, and a confusion in the minds of our leaders which is a pathetic commentary upon present human ability as compared to the indomitable spirit of our pioneering forebears.

If our present economic thought, based upon groundless laws and principles, were the product of deliberate and sinister propaganda they could no more effectively befog our thinking. We find our schools of higher learning, our colleges and universities, teach and prate about this "law" and that "law" of economics and instill a faith and mental attitude toward them which may well be the most injurious obstacle to scientific economic progress.

It is refreshing and welcome to find an editorial such as yours and a gradual simmering of sunlight through various cracks and crevices in the wall which we have placed about ourselves through our superstitious prejudices. It is my hope that you will continue remarks of this kind to speed the tide which will bring succor to our children.

H. J. Hanauer,
Treasurer, State Washed Sand and Gravel Co.
Milwaukee, Wis.

General News Briefs

THE NEWS of most importance to the largest number of rock products producers at the moment refers to the prospects for a continuation of highway construction, and progress in the fight against gasoline and motor-vehicle license tax diversion.

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Federal Aid

The appropriations committee of the House of Representatives recommends an appropriation of only $35,000,000 for federal-aid road projects for the fiscal year July 1, 1933—June 30, 1934. Various interests are fighting for the usual appropriation of $120,000,000. The most influential probably is the American Association of State Highway Officials. C. H. Moorefield, president of this association recently said:

"Decreases in federal aid, coupled with the practice of gas tax diversion within individual states, will inevitably throw an increased burden on the already over-burdened property owners. As Secretary of Agriculture Arthur M. Hyde recently pointed out, decreased road income means defaulted bonds which, in turn, will force the states to increase property taxes in order to preserve their credit.

"To safeguard present highway investments and to continue the much needed extension of state highways, the congress must continue the appropriation for each of the fiscal years of 1934 and 1935.

"Heedless reduction of federal aid will serve to throw out of employment many of the more than 330,000 men regularly employed in road work. Those men and their families will tend to become dependent on public relief funds; larger diversions may then be made from gas tax income, highways will become static and the ultimate burden will fall back on the already harrassed property owner."

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Construction Interests Active in Three States

State organizations known as "Construction Councils" are busy in at least three states. Much has already been published of their activities in New York and Pennsylvania. On January 11, the Illinois Construction Council took legal steps to have the Meents bill, which provides for state gasoline tax diversion through county bond issues to be retired by gasoline tax, declared unconstitutional or illegal. It is held that the gasoline tax is a privilege tax voted expressly for construction and maintenance of roads, and that diversion of the tax to illegal purposes has paralyzed their business.

The legislatures of 41 states—all except Alabama, Arizona, Georgia, Kentucky, Louisiana, Mississippi and Virginia—are in session or will be in session this year. Diversion of gasoline and automobile taxes will be the livest subject. The place to do effective work against this diversion is in the state legislatures.

The executive secretary of the New York State Construction Council, Thos. E. Wright, is recommending an editorial in the January *Outlook*, "The Motorist Afoot," as especially good for the arguments presented. The New York Council has also prepared a 16-pp. booklet "The General Sales Tax for Emergency Relief," which is available for wide distribution. It is a clearly worded explanation of how a general sales tax works.

Pennsylvania has a general sales tax and the major activities of the Pennsylvania Construction Council are now being directed to prevent the legislature from repealing it and turning to road funds for unemployment relief.

A recent addition to the ranks of defenders of the gasoline tax is Thomas F. Woodlock, former Interstate Commerce Commissioner, now an editorial writer on *The Wall Street Journal*. In a recent article "Killing the Goose" he wrote: "It seems to this writer that gasoline taxes in the United States should be strictly reserved for one purpose and for only one purpose, namely, the upkeep of highways and the amortization of highway bonds. Whatever else may be done in the matter this is imperative, if for no other reason than that it is essential to settlement of the rail-motor problem."

The American Automobile Association is now ready to fight diversion. Thos. P. Henry recently said: "Our clubs in many sections have a titanic fight on their hands. Only a few days ago Dr. Ray Lyman Wilbur, speaking at a Washington conference, boldly proposed that a billion dollar fund be diverted from highway construction and maintenance and used for school purposes."

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Road Programs

Thomas H. MacDonald, chief of the United States Bureau of Public Roads, addressing the recent Annual Asphalt Paving Congress, said: "The state highway systems, which I call Class A highways, comprise 330,000 miles. There remain of these approximately 100,000 miles yet to be surfaced. Of the county road systems placed above at a maximum of 600,000 miles, we may estimate 325,000 miles surfaced, leaving 275,000 miles yet to be surfaced. This leaves of the total reported surfacing 165,000 miles to be distributed back to the Class C roads of 2,000,000 plus miles."

Mr. MacDonald went on to say that the highway improvement program must be planned as a continuous activity and not one that will be finished at a definite or now foreseen time. He recommended that the administrative programs of the States should not depart from these two considerations: (1) The definite classification of the roads based on traffic, present and prospective, and (2) the setting up of a budget providing for fixed charges, maintenance, reconstruction and new construction.

Fourteen states, through their governors or highway commissioners, have joined in an effort to induce Congress to continue the usual $100,000,000 of annual appropriations for federal aid to the states for construction of highways, Representative Rainey (Dem.), of Carrollton. Ill., stated January 9.

Allotment of federal emergency funds to definite highway construction projects provided for under the Emergency Relief and Construction Act of July 21, 1932, amounted to $91,042,932 on November 30, according to the Bureau of Public Roads of the United States Department of Agriculture. Approximately $29,000,000 of the emergency funds remain available for new projects. Emergency funds are available for expenditure only during the present fiscal year which ends June 30, 1933.

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New Jersey

A road and bridge construction program for 1933 estimated at $26,184,792, including the cost of rights of way, is outlined in a schedule submitted by the New Jersey State Highway Department to Governor Moore.

The schedule includes a total of 134 miles of roads, along with bridges, viaducts and other improvements. Alternate projects involve 200 miles, the cost of which would be $33,144,900.

As of December 31, the estimated assets of the department are placed at $22,171,128. For the coming year the estimated money available is figured at $39,416,330, which takes into account prededicated funds.

John J. Hartley

JOHN J. HARTLEY, 39, western division chief engineer, Link-Belt Co., Chicago, Ill., succumbed on December 31, the innocent victim of an assassin's bullets.

Following a liberal experience in both the engineering and construction departments, Mr. Hartley also served the company in the capacity of sales engineer, and in 1929 was promoted to the position of chief engineer of its western division.

Editorial Comment

A Congress of a Great Industry

Probably most of us left the Highway and Construction Congress at Detroit somewhat bewildered; very likely unable to form any real appraisal of its significance or value. It would appear that the members of the 22 component associations which held conventions, or meetings of one kind or another, were primarily interested in the affairs of their own industries, for few of them took the trouble to attend the Congress proper. Much the same ends, apparently, could have been accomplished without the Congress, save the publicity. Much helpful literature was produced in a few days, but not much that was new to those who have followed current developments. The prestige of the Congress should, and probably will, give it a larger circulation than it might otherwise have.

The real work of the Congress was done by relatively small committees, just as committees do the real work of all conventions and congresses. Conventions and congresses themselves are too often more a hindrance to accomplishment than otherwise. They are a cherished American institution, based on the theory that all men are free and equal —with an equal voice, of course, in the determination of all policy—a voice all too frequently raised in opposition merely to establish its equality. At the same time, in the same convention, we argue against individuality in business; urge cooperation; the repeal of the anti-trust laws to compel cooperation, etc.; some even want "czars" to govern.

This particular Congress adopted a set of resolutions which we think have merit and deserve united support; yet, apparently, few of the component associations at Detroit considered these resolutions in convention, before they were adopted by the Congress. Their members in many cases will read them for the first time after they get home. It is to be hoped that individually they will give them mature consideration before yielding to the instinct to oppose them, because they had not been given an opportunity to discuss them, which is probably the present normal instinct of a free American.

Industry is learning to delegate authority to decide on policies and practices. The town-meeting, convention phase of trade association government is, we think, passing; merely one phase in the evolution of industrial democracy as the town meeting was an evolutionary phase in our political democracy. Our political democracy is held together by some fairly definite principles or conceptions; but our industrial democracies as represented by trade associations have little to guide them to common thought, objectives or ideals. Our desire for individual success in our particular industry or business is a poor substitute for the love of home and country which knits our political fabric together.

If trade or industrial associations are to take the important part they should, and eventually must, in the actual government of our country, through the influence they may exert on the Chief Executive, Congress, or better still, public opinion, they must have ideals and objectives higher than those designed merely to make profits for their members. Such needed ideals and objectives do not arise simultaneously in the minds of all the members. They are conceived and crystallized in the minds of a few and "sold" to the many by appeal to logic, reason, self-interest, emotion, or what have you.

The resolutions of the Highway and Building Congress represent the first attempt to get the various selfish interests of the construction industry to agree on an objective that at least is broad enough to include the whole industry. There is no doubt that the framers of the resolutions believe the principles for economic recovery set forth are in the interests of the Nation as well as in the interests of the construction industry. If every last member of a component part of the construction industry will accept the program in the same light and go forth to battle for it, at least as citizens we shall be conscious of doing something to help ourselves and no longer guilty of a policy of merely waiting for nature to take its course.

Of course, when we get into subjects as broad as projected inflation of currency based on the investment of labor and materials in public works there are bound to be differences of opinion, to a certain extent unexplainable, because many men have opinions for which they can give no logical reasons. The old adage "nothing ventured, nothing won" holds good in respect to the Nation's business as well as our own. We come of a pioneering race. We should not be deterred from an experiment merely because we are to be the first to try it.

Members of trade and industrial associations in the construction industry have been rather suddenly asked and expected to take a very great step. Hardly as yet "sold" on the theory that as individuals they cannot prosper unless their industry as a whole prospers, members of these associations must now adopt a theory, or policy, that their own industry cannot prosper unless the construction industry as a whole can suggest and organize a sound public works program for the country as a whole.

And we respectfully suggest that future Highway and Construction Congresses would accomplish more, and have greater prestige, if they were to be composed of accredited delegates from the component associations—delegates who come either with specific instructions from their associations, or with opportunity and talent to return to their association conventions to "sell" them the resolutions or economic plans, which it is desired for them to act upon, both collectively and individually. In other words, this Congress seems to have put the cart before the horse—it should have come first and the component association conventions afterward. Then the various association members would not have had to wait so long to know what it was all about, or just how they can best fulfill the obligations they have to a certain extent assumed.

Recent Quotations on Rock Products Securities

Stock	Date	Bid	Asked	*Dividend
Allentown P. C. 1st 6's[27]	1-18-33	No market		
Alpha P. C. com.	1-16-33	5⅞	9	25c qu. Apr. 25
Alpha P. C. pfd.	1-14-33	50	85	1.75 qu. Dec. 15
Amalgamated Phos. 6's, '36[19]	12-24-32	92	95	
American Aggregates com.[19]	12-24-32	1	4	
American Aggregates pfd.[19]	12-24-32	15	25	1.75 qu. Jan. 1
American Aggregates 6's w.w.[19]	12-24-32	32	.....	
American Aggregates 6's ex-w.[19]	12-24-32	30	.....	
Amer. L. & S. 1st 7's[27]	1-18-33	45	.....	
Arundel Corp. com.	1-17-33	16 actual sale		50c qu. Jan. 3, '33
Bessemer L. & C. Class A[4]	12-23-32	.....	2	
Bessemer L. & C. 1st 6½'s[4]	12-23-32	16	20	
Bessemer L. & C. cert. of dep.[6]	12-23-32	14	20	
Bloomington Limestone 6's[27]	1-18-33	No market		
Boston S. & G. new com.[37]	12-23-32	2	5	5c qu. July 1
Boston S. & G. new 7% pfd.[37]	12-23-32	15	25	87½c qu. Oct. 1
Boston S. & G. 7's, 1934[19]	12-24-32	55	60	
California Art Tile, A	1-13-33	½	.....	
California Art Tile, B[9]	12-22-32	.....	4	
Calaveras Cement com.	1-13-33	1	5	
Calaveras Cement 7% pfd.	1-13-33	.....	70	1.75 qu. Jan.15,'33
Canada Cement com.	1-16-33	3¼	3⅝	
Canada Cement pfd.	1-16-33	19½	.....	1.62½ qu. June 30
Canada Cement 5½'s	1-10-33	63	67	
Canada Crushed Stone bonds[42]	12-27-32	70	.....	
Canada Crushed Stone com.[42]	12-27-32	1	.....	
Certainteed Products com.	1-14-33	1	1⅛	
Certainteed Products pfd.	1-16-33	5	7	1.75 qu. Jan. 1
Certainteed Products 5½'s	1-16-33	39 actual sale		
Cleveland Quarries	1-17-33	.....	20¾	10c qu. Dec. 1
Consol. Cement 1st 6½'s, A[44]	1-17-33	3	6	
Consol. Cement pfd.[27]	1-18-33	No market		
Consolidated Oka Sand and Gravel (Canada),6½'s[12]	10-28-32	50	.....	
Consolidated Oka Sand and Gravel (Canada) pfd.[42]	12-27-32	.....	50	
Consol. Rock Prod. com.[35]	12-22-32	10c	25c	
Consol. Rock Prod. pfd.[35]	12-22-32	½	1	
Consol. Rock Products units[35]	12-22-32	¾	1¼	
Consol. S. & G. pfd. (Can.)	1-16-33	.....	50	50c qu. Nov. 15
Construction Mat. com.	1-16-33	⅛	1	
Construction Mat. pfd.	1-16-33	1⅛	4½	
Consumers Rock and Gravel, 1st Mtg. 6's, 1948[30]	12-22-32	18	22	
Coosa P. C. 1st 6's[27]	1-18-33	11	.....	
Coplay Cem. Mfg. pfd.[47]	1-17-33	6	8	
Coplay Cem. Mfg. 6's, 1941[47]	1-17-33	60	65	
Dewey P. C. com.[47]	1-17-33	60	65	
Dolese and Shepard	1-16-33	10	11	$1 qu. Jan. 1
Dufferin Pav. & Cr. Stone pfd.	1-16-33	5	20	1.75 qu. Apr. 1
Dufferin Pav. & Cr. Stone com.	1-16-33	.....	2	
Edison P. C. com.[47]	1-17-33	1	3	
Edison P. C. pfd.[47]	1-17-33	5	7	
Federal P. C. 6½'s[47]	1-17-33	55	60	
Giant P. C. com.[47]	1-17-33	1	3	
Giant P. C. pfd.[47]	1-17-33	5	7	
Gyp. Lime & Alabastine, Ltd.	1-16-33	1⅞	2¼	
Gyp. Lime & Alabastine 5½'s	1-10-33	40	44	
Hermitage Cement com.[47]	1-18-33	5	10	
Hermitage Cement pfd.[47]	1-18-33	25	30	
Ideal Cement 5's, 1943[47]	1-18-33	80	85	
Ideal Cement com.	1-16-33	12	15	25c qu. Jan. 2, '33
Indiana Limestone 6's[27]	1-18-33	No market		
International Cem. com.	1-16-33	8	8½	50c qu. Mar. 31
International Cem. bonds, 5's	1-16-33	60¼ actual sale		Semi-ann. int.
Kellev Island L. & T.	1-16-33	9	10½	25c qu. Jan. 2, '33
Ky. Cons. Stone com.	1-17-33	.....	¼	
Ky. Cons. Stone 7% pfd.	1-17-33	.....	10	
Ky. Cons. Stone 1st Mtg. 6½'s	1-17-33	10	15	
Ky. Cons. St. V. T. C.[45]	12-22-32	½	1	
Ky. Rock Asphalt com.	1-17-33	¾	1¼	
Ky. Rock Asphalt pfd.	1-17-33	8	12	
Ky. Rock Asphalt 6½'s	1-17-33	53	56	
Lawrence P. C.	1-14-33	5½	7½	
Lawrence P. C. 5½'s, 1942[47]	1-18-33	40	45	
Lehigh P. C. com.	1-16-33	5⅞	6¼	
Lehigh P. C. pfd.	1-16-33	36	36¼	87½c qu. Jan.3,'33
Louisville Cement[45]	1-18-33	55	65	
Lyman-Richey 1st 6's, 1935[13]	12-24-32	85	95	
Marbelite Corp. com. (cement products)	1-13-33	5c	50c	
Marbelite Corp. pfd.	1-13-33	25c	.....	
Marquette Cement com.[47]	1-17-33	7½	8½	
Marquette Cement pfd.[47]	1-17-33	45	50	1.50 qu. Jan.3,'33

*Latest 1932 dividend unless otherwise stated.

Stock	Date	Bid	Asked	*Dividend
Marquette Cem. Mfg. 1st 5's, 1936[46]	1-17-33	70	.....	
Marquette Cem. Mfg. 1st 6's, 1936[46]	1-17-33	70	.....	
Material Service Corp.	1-10-33	5	7½	
McCrady-Rodgers 7% pfd.[22]	12-22-32	25	30	87½c qu. June 30
McCrady-Rodgers com.[22]	12-22-32	No market		75c qu. Jan. 26
Medusa P. C. pfd.[47]	1-17-33	35	40	1.50 qu. Apr. 1
Medusa P. C. com.[47]	1-17-33	5	7	
Monarch Cement com.[47]	1-17-33	40	50	
Michigan L. & C. com[6]	12-24-32	52	.....	
Missouri P. C.	1-16-33	6	6½	25c qu. Jan. 30
Monolith Portland Midwest[9]	12-22-32	60c	90c	
Monolith P. C. com.	1-13-33	1	.....	40c s.-a. Jan. 1
Monolith P. C. pfd.	1-13-33	1⅞	.....	40c s.-a. Jan. 1
Monolith P. C. units[9]	12-22-32	3½	4¼	
Monolith P. C. 1st Mtg. 6's[9]	12-22-32	35	40	
National Cem. (Can.) 1st 7's[27]	1-18-33	70	80	
National Gypsum A com.[27]	1-18-33	1¾	2¾	
National Gypsum pfd.[27]	1-18-33	25	.....	1.75 qu. Jan. 2, '33
National Gypsum 6's[3]	1-17-33	68	.....	
National L. & S. 6½'s, 1941[19]	12-24-32	65	75	
Nazareth Cement com.[47]	1-17-33	1½	3	
Nazareth Cement pfd.[47]	1-17-33	15	20	
Newaygo P. C. 1st 6½'s[47]	1-17-33	35	38	
New England Lime 6's, 1935[14]	12-23-32	No market		
N. Y. Trap Rock 1st 6's	1-16-33	53½ actual sale		
N. Y. Trap Rock 7% pfd.[27]	1-18-33	.....	60	1.75 qu. Jan. 3, '33
North Amer. Cem. 1st 6½'s	1-16-33	18 actual sale		
North Amer. Cem. com.[27]	1-18-33	No market		
North Amer. Cem. 7% pfd.[27]	1-18-33	50c	.....	
North Shore Mat. 1st 6's[15]	1-17-33	20	22	
Northwestern States P. C.[47]	1-17-33	25	28	
Ohio River S. & G. com.	1-17-33	.....	5	
Ohio River S. & G. 1st pfd.	1-17-33	.....	50	
Ohio River S. & G. 6's[19]	12-24-32	40	50	
Oregon P. C. com.[9]	12-22-32	8	12	
Oregon P. C. pfd.[9]	12-22-32	80	85	
Pacific Coast Aggr. com.[40]	12-22-32	.....	½	
Pacific Coast Aggr. pfd.[40]	12-23-32	.....	1	
Pacific Coast Aggr. 6½'s, 1944[5]	12-23-32	10	11	
Pacific Coast Aggr. 7's, 1939[5]	12-23-32	3	5	
Pacific Coast Cement 6's[6]	12-23-32	41	.....	
Pacific P. C. com.	1-13-33	3	.....	
Pacific P. C. pfd.	1-13-33	20	.....	1.62½ qu. Jan.5,'33
Pacific P. C. 6's, 1935	12-22-32	83	.....	
Pacific P. C. 6's, 1936	12-22-32	83	.....	
Peerless Cement com.[47]	1-18-33	10c	20c	
Peerless Cement pfd.[47]	1-18-33	5	9	
Penn.-Dixie Cement com.	1-16-33	⅜	1	
Penn.-Dixie Cement pfd.	1-16-33	4	6	
Penn.-Dixie Cement 6's	1-14-33	44 actual sale		
Penn. Glass Sand Corp. pfd.[27]	1-18-33	35	45	1.75 qu. Apr. 1
Penn. Glass Sand Corp. 6's[19]	12- 2-32	75	80	
Petoskey P. C.	1-16-33	1⅞	2½	
Port Stockton Cem. com.[9]	12-22-32	No market		
Riverside Cement, A[9]	12-22-32	.....	5	
Riverside Cement, B[9]	12-22-32	.....	1	
Riverside Cement pfd.	1-13-33	52⅝	.....	1.50 qu. Feb. 1, '33
Sandusky Cement 6's[19]	12-24-32	75	85	
Sandusky Cement 6½'s, 1932-37[27]	1-18-33	65	75	
Santa Cruz P. C. com.	1-13-33	50	.....	$1 qu. Jan. 1, '33
Schumacher Wallboard com.	1-13-33	1	.....	
Schumacher Wallboard pfd.	1-13-33	3	.....	50c qu. May 15
Signal Mt. P. C. pfd.[47]	1-17-33	4	6	
Southwestern P. C. units[47]	1-17-33	120	130	
Southwestern P. C. com.[47]	1-17-33	20	25	$1 qu. Jan. 1, '33
Southwestern P. C. pfd.[47]	1-17-33	65	70	$2 qu. Jan. 1, '33
Standard Paving & Mat. (Canada) com.	1-16-33	.....	1½	
Standard Paving & Mat. pfd.	1-16-33	.....	25	50c qu. Nov. 15
Superior P. C., A	1-13-33	.....	27	27½c mo. Feb. 1, 1933
Superior P. C., B[9]	1-13-33	5¼	6	12½c Dec. 20
Trinity P. C. units[47]	1-17-33	19	22	
Trinity P. C. com.[47]	1-17-33	3	5	
Trinity P. C. pfd.[47]	1-17-33	17	20	
U. S. Gypsum com.	1-16-33	20¾	21½	40c qu. Jan. 2, '33
U. S. Gypsum pfd.	1-16-33	101	105¼	1.75 qu. Jan. 2, '33
Wabash P. C.[47]	1-18-33	5	8	
Warner Co. com.[27]	1-18-33	2	3	
Warner Co. 1st 7% pfd.[27]	1-18-33	13	18	1.75 qu. Apr. 1
Warner Co. 6's, 1944, w. w.	12-22-32	30 actual sale		
Whitehall Cem. Mfg. com.[47]	1-17-33	10	13	
Whitehall Cem. Mfg. pfd.[47]	1-17-33	25	30	
Wiscon. L. & C. 1st 6's, '33[15]	1-17-33	30	35	
Wiscon. L. & C. 6½'s[19]	12-24-32	25	35	
Wolverine P. C. com.	1-16-33	.....	3	
Yosemite P. C., A com.[9]	12-22-32	1.20	1.40	

Quotations by: [1]Watling Lerchen & Hayes Co., Detroit, Mich. [2]Bristol & Willett, New York. [3]Rogers, Tracy Co., Chicago. [4]Butler, Wick & Co., Youngstown, Ohio. [5]Smith, Camp & Riley, San Francisco, Calif. [6]Frederick H. Hatch & Co., New York. [7]J. J. B. Hilliard & Son, Louisville, Ky. [8]Dillon, Read & Co., Chicago, Ill. [9]A. E. White Co., San Francisco, Calif. [10]Lee Higginson Co., Boston and Chicago. [11]J. W. Jakes & Co., Nashville, Tenn. [12]James Richardson & Sons, Ltd., Winnipeg, Man. [13]Stern Bros. & Co., Kansas City, Mo. [14]First Wisconsin Co., Milwaukee, Wis. [15]Central-Republic Company, Chicago, Ill. [16]G. M. P. Murphy & Co., Baltimore, Md. [17]Citizens Southern Co., Savannah, Ga. [18]Dean, Witter & Co., Los Angeles, Calif. [19]Hewitt, Ladin & Co., New York. [20]Tucker, Hunter, Dulin & Co., San Francisco, Calif. [21]Baker, Simonds & Co., Inc., Detroit, Mich. [22]Peoples-Pittsburgh Trust Co., Pittsburgh, Penn. [23]Howard R. Taylor & Co., Baltimore. [24]Richards & Co., Philadelphia, Penn. [25]Hincks Bros. & Co., Bridgeport, Conn. [26]Bank of Republic, Chicago, Ill. [27]National City Co., Chicago, Ill. [28]Chicago Trust Co., Chicago, Ill. [29]Boettcher-Newton & Co., Denver. [30]Hanson and Hanson, New York. [31]S. F. Holzinger & Co., Milwaukee, Wis. [32]Tobey and Kirk, New York. [33]Steiner, Rouse and Co., New York. [34]Jones, Heward & Co., Montreal, Que. [35]Tenney, Williams & Co., Los Angeles, Calif. [36]Stein Bros. & Boyce, Baltimore, Md. [37]Wise, Hobbs & Arnold, Boston. [38]E. W. Hays & Co., Louisville, Ky. [39]Blythe Witter & Co., Chicago, Ill. [40]Martin Judge Co., San Francisco, Calif. [41]A. J. Pattison Jr. & Co., Ltd., Toronto, Canada. [42]Nesbitt, Thompson & Co., Toronto. [44]E. H. Rollins, Chicago. [45]Dunlap, Wakefield & Co. Louisville, Ky. [46]First Union Trust & Savings Bank, Chicago. [47]Anderson, Plotz and Co., Chicago, Ill. [48]Hemphill, Noyes and Co., New York City.

Financial News in Brief

FINANCIAL NEWS relating to the rock products industries over the year-end is not in general cheerful; there is evidence that many corporations are in the throes of financial reorganization.

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Consumers Rock and Gravel Co., Los Angeles, Calif., controlled and managed by the Consolidated Rock Products Co., through ownership of common stock, has announced its inability to meet interest payment on 6% first mortgage gold bonds, which was due January 3; a bond holders' protective committee has been formed. It is said bond holders were asked to waive interest and principal payments for two years; the request was refused by the bond underwriters. There are also some unpaid taxes; the total charges unpaid January 3 were $45,000; the bonds outstanding amount to $1,166,000.

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Marblehead Lime Co., Chicago, Ill., according to press reports, has advised holders of $510,000 first mortgage 6% bonds that interest due January 1 could not be paid; nor the serial maturity of $35,000 principal be retired. The decision was made in order to preserve working capital and assure continued operation. Sales of the company in 1932 (11 months ended October 31) are reported to have been $470,936 against $1,089,052 in 1929; the average price in 1932 was $7.98 per ton against $9.02 in 1929. If the company fails to cure the default within a reasonable time, it has promised to cooperate with bond holders in development of a plan for reorganization.

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Iron City Sand and Gravel Co., Pittsburgh, Penn., according to press reports, January 5, was placed in receivership by Federal Judge Gibson, on an action filed by the first mortgage bond underwriters. George Vang, president of the company, and V. L. P. Shriever are the receivers. Assets are given as $2,700,000 and dredges and equipment listed at $1,700,000.

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American Aggregates Corp., Greenville, Ohio, has informed stockholders that in order to remove the risk of being required to meet definite and fixed corporate obligations each year, the management is giving consideration to the rearrangement of the capital structure. The net sales for 1932 are reported to have been less than one-half the net sales of 1931; and that in spite of drastic economies a substantial loss was suffered.

Petoskey Portland Cement Co., Petoskey, Mich., announces that the holders of its serial gold notes have cooperated by accepting securities set ahead three years, making payments other than interest unnecessary during the years 1932, 1933, 1934.

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American Sand and Material Co., St. Louis, Mo., has been placed in federal receivership by a stockholder and several intervening creditors; temporary receivers are Lewis J. Stiers, contractor, and Henry Mueller, banker.

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Consolidated Oka Sand and Gravel Co., Ltd., Toronto, Ont., is reported to have defaulted on interest payment on November 1 on 6½% first mortgage bonds.

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Ohio River Sand and Gravel Co. (of West Virginia), Pittsburgh, Penn., is reported to have defaulted on interest payment due December 1, 1932, on its first mortgage 6% bonds of 1939.

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National Gypsum Co., Buffalo, N. Y., will retire its common stock of no par value and substitute common stock of $5 per share par value for Class A and $1 per share par value for Class B. This will permit writing down the company's properties to book values more nearly representing their present worth. The change in common stock will transfer approximately $800,000 from capital to surplus account.

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Superior Portland Cement, Inc., Seattle, Wash., for the year ended December 31, 1932, reports a balance sheet as follows:

ASSETS

Cash	$ 76,407
Investments	363,246
Accounts and notes receivable	61,470
Inventories	361,359
Deferred assets (work in process)	319,105
Total current assets	$1,181,587
Plant, real estate, etc.	4,722,613
	$5,904,200

LIABILITIES

Accounts and notes payable	$ 28,768
Payrolls	5,545
Reserves for taxes	54,597
Other reserves	58,051
Total current liabilities	146,961
Capital and surplus	5,757,239
	$5,904,200

The board of trustees chose the following officers: E. P. Lucas, president; C. N. Reitze, vice-president and general manager; G. E. Dickinson, vice-president and secretary; C. L. Wagner, vice-president in charge of operations; Gordon Tongue, treasurer and sales manager.

Northwestern States Portland Cement Co., Mason City, Ia., reports shipments for the year ending November 30, 1932, 40% less than the preceding year. It is said the company has never been so well equipped to make and market cement at costs which will result in profits with any return of normal demand. The balance sheet as of November 30 is reported as follows:

ASSETS

Plant and equipment (Mason City)	$6,543,021.68
Plant and equipment (Gilmore City)	565,711.67
Cement stock and materials in process	345,460.52
Inventories	226,866.94
Current assets	998,748.61
Investments and funds at interest	837,425.43
	$9,517,234.85

LIABILITIES

Capital stock	$5,250,000.00
Surplus	26,234.62
Current liabilities	120,407.95
Reserves (depreciation, depletion, etc.)	4,120,592.28
	$9,517,234.85

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Arundel Corp., Baltimore, Md., declared a quarterly dividend of 50c. payable January 3, 1933; 75c. quarterly has been paid January 1, 1930, to October 1, 1932, inclusive.

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Ideal Cement Co., Denver, Colo., paid its usual quarterly dividend of 25c. per share, January 2, but the directors did not vote an extra dividend, as has been the custom annually for some years. Last year it was 25c. extra; before that, 50c.

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Santa Cruz Portland Cement Co., San Francisco, Calif., in addition to its regular quarterly dividend of $1 per share, January 1, paid an extra dividend of $1 December 27. For the last four years the company has declared an extra dividend of $2 a share in December.

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Lehigh Portland Cement Co., Allentown, Penn., according to press reports, has filed a claim for $402,307 and interest against the U. S. Government for refund of certain income taxes paid in 1919.

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Hoosac Valley Lime Co., Adams, Mass., announced its inability to meet interest payment on its first mortgage 6% bonds, December 1, 1932; nor was the Rockland and Rockport Lime Corp., Rockland, Me., guarantor of these bonds, able to provide the funds. A bond holders' protective committee has been appointed. The company has offered a plan under which bond holders are asked to agree to take no action to foreclose because of default in payment of interest for a period of three years; to accept an interest warrant in exchange for original

coupons covering a three-year period. The company would agree to pay interest to bond holders, from time to time, as earnings of the company may permit, and would pay no dividends until all accrued interest shall have been paid. The Rockland and Rockport Lime Corp. would agree to waive payment of interest and any part of principal of its loan to the Hoosac Valley Lime Co. until all accrued interest shall have been paid.

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Standard Paving and Materials, Ltd., Toronto, Ont., directors have decided to defer declaration of quarterly dividend due February 15, 1933, on 7% cumulative convertible preferred stock, par $100, until after the financial statement for the year ending March 31, 1933, is available.

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Roquemore Gravel Co., Montgomery, Ala., was bid in January 2 for $50,000 by the Citizens and Southern Co., bankers, Savannah, Ga., bond underwriters, for bond holders who had a $200,000 equity. It is reported operation of the plant will be resumed in a few weeks.

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Canada Cement Co., Ltd., Montreal, Que., annual report for year ended November 30, 1932, states consumption of cement declined 52% from previous year; gross earnings declined 49%. The premium on New York funds required to meet bond interest payments alone amounted to $102,995. No preferred dividends paid after the first two quarters.

EARNINGS STATEMENT
(Years ended November 30)

	1932	1931
Profits from operation	$2,641,724	$5,182,421
Provision for depreciation	555,656	2,071,101
Premium on N.Y. funds	102,995	.....
Bond interest	1,052,748	1,076,066
Reserves	145,400	468,824
Preferred stock sinking fund	.....	13,239
Net income	$ 784,931	$1,553,191
Preferred dividends	680,677	1,362,751
Balance surplus	$ 104,254	$ 190,440
Earnings per share on 600,000 shares common stock (no par)	Nil	$0.31

BALANCE SHEET
ASSETS

	1932	1931
*Land, buildings, equipment, etc.	$39,461,437	$39,633,435
Inventories	2,144,280	2,113,609
Accounts receivable	315,866	1,046,897
Deposits on tenders	9,302	56,058
Deposits under Workmen's Compensation Commission	75,440	75,441
Government bonds and other securities	450,445	520,267
Invested in company's bonds	1,126,500	.....
Cash	1,320,261	1,662,393
Deferred charges to operation	76,945	84,649
Investments	3,692,467	5,607,798
Total	$48,672,944	$50,800,547

LIABILITIES

	1932	1931
Preference stock	$20,086,900	$20,965,400
†Common stock and surplus	7,166,586	7,062,333
First mortgage sinking fund bonds	18,732,500	19,178,000
Accounts payable	608,950	737,930
Bond interest accrued and unpresented coupons	103,891	105,009
Purchase money obligations	600,000	900,000
Preferred stock receivable account	55,900	34,600
Preferred dividend	.....	340,679
Reserves	1,318,216	1,476,595
Total	$48,672,944	$50,800,547

*After deducting depreciation.
†Represented by 600,000 shares (no par).

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(Proposed) **Standard Cement Co.,** San Francisco, Calif.; an agreement is reported to have been reached by company representatives to include Pacific Portland Cement Co., Santa Cruz Portland Cement Co., Calaveras Cement Co. and Yosemite Portland Cement Corp., but ratification by the directors and stockholders of each concern will be necessary. The regular annual meetings of the four companies are scheduled from January 19 to April 5, 1933, and unless special meetings are called it is probable that ratification of the terms if and when worked out will be undertaken at the regular meetings. Present plans call for sale by each of the four companies of all cement manufacturing properties to Standard Cement, payment to be made in no-par capital stock of the new concern, which will be issued in the amount of 2,000,000 shares of $10 stated value. Assets other than those now used in cement manufacture would not be transferred to Standard.

CAPITALIZATION OF FOUR COMPONENT COMPANIES OF PROPOSED STANDARD CEMENT CO.

	Calaveras	Pacific Portland	Santa Cruz	Yosemite
Common stock (number of shares)	$125,000	*82,500	†100,000	.....
Class A stock (number of shares)	.....	.....	.....	‡234,000
Class B stock (number of shares)	.....	.....	.....	‡140,000
Preferred stock (number of shares)	* 22,625	*70,000	.....	.....
6% serial gold notes	.....	$1,300,000	.....	.....

*Par $100. †Par $50. ‡Par $10. §No par value.

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Riverside Cement Co., Los Angeles, Calif., reports for the year ended December 31, 1932, a condensed balance sheet as follows:

ASSETS

Cash		$ 863,097.45
Notes and accounts receivable, less provision for discounts and bad debts		270,232.51
Inventories: cement, supplies, etc., at cost		1,021,668.94
Total current assets		$ 2,154,998.90
Stocks and bonds		251,823.37
Treasury stock		278,258.46
Represented by 5459 shares first preferred.		
Other investments		673,244.48
Deferred charges		51,868.92
Real estate, plant and equipment, less depreciation and depletion		7,873,989.03
Total assets		$11,284,183.16

LIABILITIES

Payrolls, accruals, accounts payable and reserve for federal income tax		$ 83,106.95
Total current liabilities		$ 83,106.95
Other reserves		115,852.48
Sundry items		57,444.13
Capital		9,552,500.00
Represented by:		
57,567 shares first preferred stock		
240,000 shares Class "A" stock		
345,000 shares Class "B" stock		
Earned surplus	$ 251,416.07	
Surplus appropriated for retirement of first preferred stock	178,424.48	
Capital surplus	1,045,439.05	
		1,475,279.60
Total liabilities		$11,284,183.16

During 1932 the volume of sales of the company declined approximately 20% from the low volume of 1931. Operations during 1932 were conducted at a rate less than 25% of the company's producing capacity.

Dividends in the sum of $322,104 were paid during 1932 on the company's preferred stock. The original issue was 65,000 shares. During the year stock was retired to the extent of 2007 shares, leaving outstanding a present total of 57,567 shares. Of this amount the company holds for future retirement 5459 shares purchased at a cost of $278,258.46. This figure includes purchases in 1932 amounting to $172,967.96. Although the stock has been purchased at very favorable prices, it has been retired at cost, and the saving not reflected in income account.

No adjustment has been made for decline in market value of stocks and bonds, which are carried on the balance sheet at cost.

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Sandusky Cement Co., according to an announcement dated January 5, by the Cleveland Trust Co., trustee, had not provided funds for payment of the $340,000 installment of the principal due January 1, 1933, on its 6% serial debenture notes. The notes are dated January 1, 1929. The Medusa Portland Cement Co., Cleveland, Ohio, which subsequently absorbed the Sandusky Cement Co., has asked holders of these matured debenture notes to agree to extend the maturity date to January 1, 1935; and the notes maturing January 1, 1934, to January 1, 1936; the notes to be delivered to the trustee to be stamped, giving effect to the extended maturity and appropriate additional coupons attached. As a consideration for the postponement of maturity the cement company offers to pay a 2% bonus. The January 1, 1933, interest will be paid on the entire issue of notes upon deposit of the notes for endorsement of the plan, and the 2% bonus will be paid when the plan shall have been declared effective.

Recent Dividends Announced

Arundel Corp. (qu.)	$0.50	Jan.	3
Calaveras Cement 7% pfd.	1.75	Jan.	15
Idaho Portland Cement pfd. (s.a.)	3.50	Jan.	15
Ideal Cement com. (qu.)	0.25	Jan.	2
Kelley Island Lime and Transport com. (qu.)	0.25	Jan.	2
Marquette Cement Mfg. 6% pfd. (qu.)	1.50	Jan.	3
Pacific Portland Cement 6½% pfd. (qu.)	1.62½	Jan.	5
Riverside Cement pfd. (qu.)	1.50	Feb.	1
Santa Cruz Portland Cement (qu.)	1.00	Jan.	1
Southwestern Portland Cement (qu.)	1.00	Jan.	1
Southwestern Portland Cement pfd. (qu.)	2.00	Jan.	1
Superior Portland Cement A (mo.)	0.27½	Feb.	1
Superior Portland Cement B com. (qu.)	0.12½	Dec.	20

Rock Products News Briefs

Cement

H. STRUCKMANN, president of the International Cement Corp., New York, N. Y., recently was quoted at length in the *New York Herald-Tribune* on the importance of continuing public works rather than resorting to what is in effect a dole when paid in the form of direct relief to unemployed. The importance of road work in providing employment was stressed.

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ENTERING the "Buy American" fight, John A. McCarthy, president of the Mason Material Dealers' Association of New York, is urging the use of American cement. Each truck of his own company carries huge signs reading "Buy American Cement." According to Mr. McCarthy, British cement manufacturers expect to increase their shipments to this country in 1933 from 300,000 to 1,000,000 bbl.

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LAFARGE "super" white portland cement is announced by the International Non-Staining Cement Co., Inc., New York, N. Y. This new cement is double burned, and from 97 to 98% passes 200-mesh. It has high early strength, and produces a mortar that is plastic, workable, non-staining and non-efflorescent, the company states. The cement is claimed to meet A.S.T.M. specifications for portland cement. It will sell at regular prices for domestic white cement.

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ANNOUNCEMENT that the Chubbuck, Calif., plant of the National Portland Cement Co. has started production and has closed shortly after was made in recent issues of ROCK PRODUCTS. The *El Paso* (Tex.) *Post* now reports that E. S. Gates has been named to head the company to "raise sufficient finances to put the company out of danger." El Paso stockholders are requested to purchase an additional share of stock for $10.

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SALE of assets and properties of the Utah-Idaho Cement Co., Ogden, Utah, by the receiver to the Western Portland Cement Co., a newly incorporated organization, has been approved and confirmed by a district court judge.

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NATIONAL PORTLAND CEMENT CO. reports contract for construction of its new plant, to be built at Brodhead, Penn., the promotion of which has been reported in ROCK PRODUCTS at various times, has been let to W. S. Barstow, Inc., of Reading. Mr. Barstow organized and was president of the Metropolitan Edison Co. of Reading at one time.

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Crushed Stone

IN December the plant of the Long Stone Co., Lima, Ohio, was destroyed by fire of undetermined origin. Loss was placed between $40,000 and $50,000. According to Val Heil, president, the structure will be rebuilt at once.

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A CRUSHED stone producer has been involved in unusual litigation. Suit has been brought against an Ohio county board of commissioners, a road contractor and the stone producer. The suit is the result of personal injury claimed to have resulted from a pile of stone intended for use on county roads which, it is said, was allowed to stay in the traveled portion of the road, causing an accident.

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A THREE-MONTH mine safety campaign was started January 1 by a group of Ohio state and federal agencies. A number of limestone and gypsum operators are entered in the campaign.

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Gypsum

CONSIDERABLE significance might well be placed on reports that in 1932 investment trusts had increased holdings of the following companies: United States Gypsum Co., Johns-Manville Corp. and Owens-Illinois Glass Co. In commenting on this trend the *New York* (N. Y.) *Times* says "it would seem that 'beer and building' might be taken as the watchword," from which the rock products industry might find cause for hope.

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PRESS reports tell of incorporation of the International Gypsum Co., Ltd., St. John's, Newfoundland, with capital of $1,750,000 to develop gypsum deposits at Flat Bay Brook on properties owned or controlled by Wm. H. Taylor. It is planned to export crushed gypsum and to make and export plaster. Orders are on hand from New York firms, it is reported.

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Rock Phosphate

FROM the Tennessee district comes news that 1470 acres with several million tons of phosphate rock and a plant which would cost $40,000 to replace recently was sold under foreclosure to mortgage holders at less than $15,000. Activity in the field is largely limited at present to hand miners, who have been favored with excellent weather in recent weeks, and have accepted current prices, so low they are unattractive to operators who consider overhead costs.

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IT now develops that plans for extensive development of Montana phosphate beds announced in the December 31 issue of ROCK PRODUCTS include the consolidation of a number of present operators into one organization. It is claimed that no financing will be required. A sales organization is being developed in Washington, Oregon, Iowa, Wisconsin, Minnesota, Nebraska and the Dakotas.

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Sand and Gravel

A BILL proposed by county commissioners of Prince Georges, Md., will allow gravel and mineral deposits that are being worked to be assessed at a higher figure than similar land being used for agricultural purposes. Probably it will affect operators of dredges to the greatest extent, as the bill is expected to be limited to the county where it is originating and dredging operations predominate, though there are some quarry operations and deposits of Fuller's earth.

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THE Western Pennsylvania Sand and Gravel Association claims Alleghany county's specifications for road surfaces are "extremely unfair" and asks public hearing of the charges. Gravel is not permitted in concrete for road construction, it is claimed, and a change to allow its use is asked.

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IN Mississippi the attempt of the Mississippi Sand and Gravel Co., of Columbus, to obtain an additional reduction in sand and gravel freight rates will be taken up at the February meeting of the Mississippi Railroad Commission. The reduction sought is 5c per ton.

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AN ordinance has been passed in Sacramento, Calif., requiring that washed sand, gravel, and crushed stone used for construction purposes be sold and delivered by weight instead of cubic measure.

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IT has been recommended that the Los Angeles Rock and Gravel Co., Los Angeles, Calif., be paid $55,000 by the city for damages alleged to have been sustained by the concern under a restraining order which stopped it from removing rock and sand from the Arroyo Seco section. The case has been under way since 1925 and further delay may result from introduction of further evidence by a councilman.

Digest of Foreign Literature

By F. O. Anderegg, Ph.D.
Consulting Specialist, Pittsburgh, Penn.

Variations in Setting Time of Portland Cement II.—Paul Schachtschabel continues the description of his experiments (Rock Products (1932) **35**, No. 24, p. 40) by spreading some of the same cement, ground with 3% gypsum in a mill without air separation, in a layer about 1 in. thick in the air. In two hours it had inverted into a flash setter, but after 14 days it had reverted to a slow setting cement. Repeating, he found that sometimes the inversion took place and sometimes not. Analysis failed to show any difference in H_2O or CO_2 content. Suspecting the action of CO_2, he passed dry, and later, moist gas over the cement without effect. But when he placed the cement in a flask and introduced moist CO_2 with shaking, the setting time was accelerated after one and two hours but after 24 it was back to normal. This proved that moisture was involved in the inversion. Also on not shaking the cement in the flask, it was not inverted. Moisture was taken up by the alkalies and then CO_2 replaced the water with decomposition. In the presence of larger amounts of moisture the flash setting did not take place. Again a flash setter was retarded by exposing to damp air for three hours.

Inversion of a cement into a flash setter depends upon: the presence of minimum alkali content of 1.2%; the absorption of the correct amount (not too much and not too little) of moisture to promote hydrolysis of the alkali aluminates; the absorption of CO_2 to form alkali carbonates; the presence of an appreciable amount of $CaSO_4$ in a more readily soluble form than gypsum, and the interaction of alkali carbonates with $CaSO_4$ to spoil its effectiveness in retarding the setting reactions. The alkali content for rotary kiln feed should then be kept below 1.2%. When very little or considerabe moisture is taken up by the cement, flash setting will not occur. When the gypsum is transformed into hemihydrate or even into readily soluble anhydrite in the grinding mill where heating takes place, trouble may result. To prevent this last reaction, the mill should be kept cool. An air separator helps to keep the temperature down.—*Zement* (1932) 21, No. 46, pp. 643-647; No. 47, pp. 658-661.

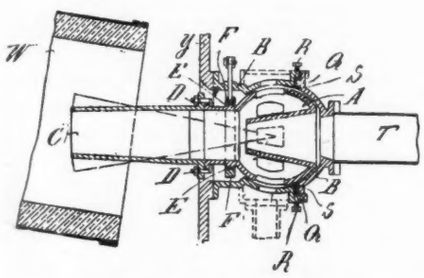
Drying Gypsum Board—O. Thümmel describes a tunnel kiln for drying gypsum products. Thin boards are supported from the top and evenly spaced, so that the drying will take place uniformly, in racks on cars which pass through the kiln. The necessary heat is secured by burning coke in a special burner and mixing the products of combustion with air to secure a temperature not higher than 160 deg. F. so as not to remove the water of crystallization.—*Tonindustrie Zeitung* (1932) 56, No. 94, pp. 1159-1161.

Editor's Note

After much experimenting with translators and abstracters the editor has obtained the cooperation of the one man in the industry best qualified, not merely through his knowledge of foreign languages but by his expert knowledge of the rock products industries, to conduct this page.

Dr. Anderegg is too well known in this industry to need an introduction. His abstracts will be real digests, with the benefit of comment of his own, where necessary. He will be glad to supply readers with additional information when wanted.—The Editor.

Rotary Kiln Firing.—Is it possible with the present stationary tube which carries the powdered coal blast into the cement kiln to secure as accurate a control of the length of the clinkering zone as is desired? Can ring formation be prevented and still maintain the proper heating conditions for the calcining? E. Schirm analyzes these questions and after pointing out the defects and limitations in several proposed schemes concludes that the nozzle should be adjustable. This can be secured with the aid of a universal joint, permitting of directing the flame in any direction within the kiln. Very satisfactory results are claimed for this device in actual practice.—*Zement* (1932) 21, No. 44, pp. 601-604; No. 45, pp. 631-634.



Adjustable, universal point nozzle for firing pulverized coal

The Effect of Mechanical Working on Concrete During Setting.—How can concrete in roads be handled so as to permit much earlier use? The usual method has been to allow the concrete to stand without molestation for a period of time before opening to traffic, but Albert Hauenschild finds that when concrete is rolled, pounded or even loaded steadily up until the initial set is reached, appreciably higher compressive strengths can be secured. Highest results were obtained by pounding, but rolling is the most practical method. The results in the table were obtained by the German Standards methods, including earth dry consistencies.

Compressive strengths p.s.i.

Standard portland	Unit weight	1:3 3 da.	7 da.	28 da.
Normal sand	138	2295	2852	3570
Commercial sand	142	2746	3520	3944
Rolled 12 hr.	150	3520	4120	5490
Rolled 18 hr.	150	3620	4660	6406
Pounded 6 hr.	150	6075	6830	8500
High early strength 1:3				
Normal sand	138	2858	3563	4460
Commercial sand	142	3175	4083	4505
Rolled 12 hr.	150	3620	4790	5770
Rolled 18 hr.	150	3520	4660	5850
Pounded 6 hr.	152	7340	7720	8500
Pounded 12 hr.	153	7110	7720	8500
Pressed 6 hr.	147	3730	5110	6200

Zement (1932) 21, No. 45, pp. 634-636.

Determining Setting Time with an Electric Current.—The possibility of using a convenient electrical method of determining the initial set of cement or plaster has been considered by G. Baire. Using a 50-cycle 3-phase circuit at about 27 v. with a sensitive ammeter, the current being applied for short periods of time only, he was able to check the Vicat needle. If the current was allowed to flow continuously, the specimen became heated and reached its initial set too soon. Some of our electrical experts should get busy and devise a simple, reliable apparatus which would automatically record the initial set of portland cements and of plasters.—*Revue des materiaux de construction et de travaux publics* (1932), No. 277, pp. 405-407.

Fine Cement.—Antoni Eiger of Warsaw discusses the effect of the water-cement ratio in the range from 0.3 to 0.6 by volume on finely ground cements. Concrete made from portland cement ground to three different degrees of fineness as well as a slag and a Kühl cement, each ground to two size distributions, showed at seven and 28 days compressive strengths which generally were proportional to the surface area. At low water-cement ratios full advantage may not be taken of the finer ground cement, if sufficient water for proper hydration is not added.—*Tonindustrie Zeitung* (1932) 56, No. 94, pp. 1158-1159.

Natural Gas for Cement Burning.—In Roumania some of the cement plants use the local natural gas for burning portland cement with satisfactory results, provided a proper mixture of air and gas is obtained, according to Albert Heiser.—*Tonindustrie*

Zeitung (1932) 56, No. 96, pp. 1180-1181.

More Lime for German Soil.—The impoverishment of German soil in lime began during the war and has continued since that time. The condition has been aggravated by the use of acid fertilizers. At a recent meeting the German Lime Association got together with the chief fertilizer interests and farm leaders and plans were laid for raising money to stimulate the increased use of lime in the soil to correct its acidity. Anon.—*Tonindustrie Zeitung* (1932) 56, No. 89, pp. 1095-1096.

The Name, "Cement."—Goslich says that our word, cement, has its origin in the Latin caedere (to hew) and referred to stone cut for building purposes. Masonry built of such stone was called caementa by the old Roman writers, Pliny, Cicero and Livius. In 1744, Loriot, translating Pliny into French, made the mistake of changing "caementa" into "ciment," in the sense of a mortar hardening under water. The word then passed into different languages. The French and German word for concrete, "Beton," is also a misnomer, having been derived from the Arabian word for mineral pitch, from which our word "bitumin" is derived.—*Tonindustrie Zeitung* (1932) 56, No. 89, pp. 1097-1098.

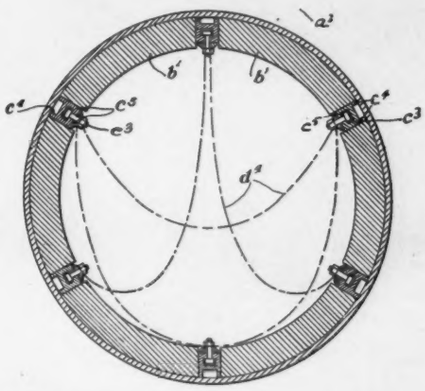
Patent Abstracts

The following brief abstracts are of current process patents issued by the U. S. Patent Office, Washington, D. C. Complete copies may be obtained by sending 10c to the Commissioner of Patents, Washington, D. C., for each patent desired.

Portland Cement. This is a high-early-strength portland cement. The specifications, but not the claims, say that it should be made from three kinds of clay, one high in alumina, one high in silica and the third with a small percentage of iron. These are ground first in a ball mill to 20 mesh or under and again in a tube mill to a satisfactory slurry. It is stated that the lime content should be 0.5% higher than in normal mixes.

The burning is to be at 2700 deg. F. and the clinker, which is drawn off at 2000 deg. F., is to be immediately quenched in water. Before final grinding, and this is the feature covered by the claims, chlorides and a metal soap are added to the clinker; 0.9% sodium chloride and 0.1% calcium chloride and 0.15% aluminum stearate are mentioned as suitable, in the specification. About 0.5% quicklime may be added to absorb water and any free CO_2. The preliminary grinding of the clinker is carried to about 78% on 200 mesh and the final grinding, after the other ingredients are added, is preferably carried to 95% through 200. The specifications contain tables of compressive strength tests at various ages. For 1-2-3½ concrete the strengths run from 2120 lb. for 1 day to 5271 for 28 days.—*Andrew Lundteigen, assignor to Ash Grove Lime and Portland Cement Co., Kansas City, Mo., U. S. Patent No.* 1,794,526.

Rotary Kiln. The inventor has previously patented the placing of chains in a kiln in a manner that helical loops will be formed that will urge the slurry forward. He finds that the chains must be dense to be effective. This holds so much heat that the chains burn off with the ordinary fastening. The present invention is a form of fastening, the main feature of which is a hollow bar in direct contact with the shell, so that the heat may be radiated away. This bar is placed in channels between segments of the fire brick lining.—*L. S. Petersen, assignor to F. L. Smidth and Co., New York, N. Y., U. S. Patent No.* 1,796,664.



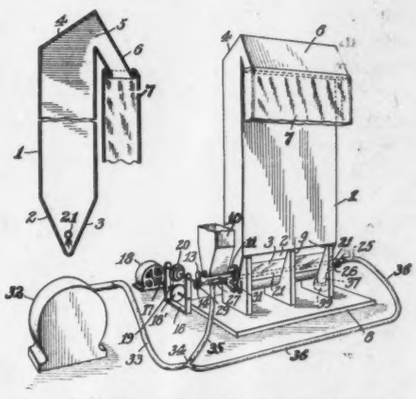
Method of hanging chains in a kiln

Structural Material. The material covered by this patent is made in the form of a slab or tile. The backing is of hydraulic cement and asbestos combined, according to a previous patent of the inventor. The surface is of cement and hard-burned kaolin, preferably, although it may be made of pulverized quartz sand or flint and cement. The specifications cover a great many details of the method of manufacture. Properly made, it is said that the surface repels dirt and is easily cleaned, resisting abrasion by scouring materials. The aggregate sizes for the surface mixture are recommended to be between 100 mesh and 300 mesh.—*Charles L. Norton, U. S. Patent No.* 1,871,730.

Method of Manufacture of Portland Cement. The purpose of the method, the inventor says, is to produce a high-lime portland cement containing more than 69% lime or the molecular equivalent of other dioxides, magnesia, for example. In one of the applications of the method described the lime is burned in a kiln to the point of incandescence (lime light), which is the point of fusion with clay.

The clay, which must have a ratio of at least 5 to 1, silica to sesquioxides, is introduced through to walls of the kiln just above the melting zone. It trickles down and unites with the lime. The extent of the combination is dependent upon the temperature obtained and in the presence of an excess of lime the clay will all combine with the optimum amount of lime corresponding to the given temperature. Thus, the inventor says, it is not necessary to control the mixture of the lime and clay before burning. The control of the process lies in the control of the temperature. The fused mass produced is chilled suddenly to prevent dissociation during cooling. After cooling the material is ground to 90% through 200 mesh.—*Paul B. Whelan, U. S. Patent No.* 1,852,547.

Process and Apparatus for Continuous Separation of Fine Materials. This process and device employs a current of compressed air to lift the fines and the principal difference from some earlier forms of separators is the manner in which the continuous operation is secured. The feed, a sample of such material as cement or ground limestone, is placed in the hopper 10. From this it is forced into the separating chamber of the device by a screw in the tube 11, which is driven by the little motor 18. If the hopper is kept filled no air can pass the screw and escape. The separating chamber, which is of V-section, has a glass panel through which the separating action may be observed. A pipe, 21, passes longitudinally through this chamber and works back and forth in air-tight bearings, being driven by the same motor that drives the screw. There are holes in the bottom of this pipe, 21, through which the air that does the separating escapes. The air comes from the blower 32 and enters both ends of the pipe through the tubes 35 and 36. In operation the feed falls to the bottom of the separating chamber and is played upon by the jets of air from the holes in the pipe 21. This breaks up and distributes the mass and the air lifts the lighter particles and carries them through the flue 1 to the bag filter 7. The coarse particles that cannot be lifted work along the bottom of the separating chamber and finally fall into the pipe 37.—*J. C. Pearson and Frank A. Hitchcock, U. S. Patent No.* 1,791,426. (The inventors were formerly engaged in cement investigation at the U. S. Bureau of Standards and Mr. Pearson is one of the inventors of the bureau's air analyzer, used for separating the finer particles of cement.—EDITOR.)



Apparatus for air separation

Traffic and Transportation

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week ending January 21:

TRUNK LINE ASSOCIATION DOCKET

30149. **Stone, natural** (other than bituminous asphalt rock), **crushed**, carloads (See Note 2), from Watertown, N. Y., to Gabriels, N. Y., $1.50 per net ton, and from Gouverneur to Whippleville, Chasm Falls, Owls Head, Mountain View, Plumadore, Loon Lake, Lake Kushaqua, Onchiota, Rainbow Lake and Gabriels, N. Y., $1.50 per net ton. (See Note 4.)

30152. **Stone, natural** (other than bituminous asphalt rock), **crushed**, carloads (See Note 2), from Buffalo and Bowmansville, N. Y., to N. Y. C. R. R. stations—Presho, Elkland, Westfield, Tioga, Wellsboro, Tiadaghton, Blue Stone, Jersey Shore, Newberry Jct., Penn., and various. Rates ranging from $1.40 to $1.80 per ton. (See Note 4.)

30156. **Crushed stone, gravel** (other than molding), **pebbles** (other than flint or grinding), **sand** (other than blast, engine, filter, foundry, glass, molding, quartz, silex or silica), and **slag**, carloads (See Note 2), from actual shipping points in Eastern Trunk Line territory (other than those located in Southern New Jersey) on the Pennsylvania R. R. and Reading Co. to local destinations on the Pennsylvania R. R. and Reading Co. within a radius of 200 mi. from shipping point, except where rates were issued to meet motor truck competition. Proposed rates to be based on the Lycoming scale, which is as follows (See Note):

Miles	Rate	Miles	Rate
1 to 15	$0.60	81 to 100	$1.10
16 to 25	.70	101 to 125	1.20
26 to 40	.80	126 to 150	1.30
51 to 60	.90	151 to 175	1.40
61 to 80	1.00	176 to 200	1.50

Note—For joint hauls add 20c to single-line rates.

30166. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Morrisville, Penn., and Masonville to South Pemberton, N. J., to Grassland, Penn., 90c per net ton. Present rate, $1.10. (See Note 4.)

30167. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Morrisville, Penn., to Lebanon, Penn., $1.30 per net ton. Present rate, $1.50. (See Note 4.)

30169. **Crushed stone**, carloads, to Atlantic City, N. J., from Philadelphia, Penn., 90c; from Cedar Hollow, Devault, Exton (Swedesford Rd.), Glen Mills, Howellville, Morrisville and Rock Hill, Penn., $1.10, and from Birdsboro, Durham, Rocky Hill, Lambertville, N. J., Stowe and Trap Rock, Penn., $1.20 per net ton. (See Note 4.)

30170. Sand, other than blast, engine, fire, foundry, glass, molding, quartz, silex or silica, in straight or mixed carloads, also **gravel**, carloads (See Note 2), from Highspire, Penn., to Greenfield, Coatesville, Falmouth, Royalton, Mifflin, Cly, Liverpool, Oakville, East Fayetteville, Nunnery, Chambersburg, Penn., and various. Rates ranging from 60c to $1.25 per ton. (See Note 4.)

30175. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Morrisville, Penn., to Lewistown, Milroy and McVeytown, Penn., $1.50 per net ton. (See Note 4.)

30178. **Sand**, in open top cars, carloads (See Note 2), from Tatesville, Penn., to Pennsylvania R. R. stations—Cessna, Hyndman, Manns Choice, Wolfsburg, Bald Eagle, Calcite, Curry, Hollidaysburg, Oreminea, Tyrone, Mt. Union, Warrior Ridge, Penn., and various. Rates ranging from 80c to $1.20 per net ton. (See Note 4.)

30183. To increase rate of 70c to 80c per net ton on **asphalt sand**, carloads (See Note 2), from Eatontown, N. J., to Garwood, N. J.

30185. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Morrisville, Penn., to Conshohocker Penn., 80c per net ton. Present rate, $1. (See Note 2.)

30189. **Limestone, finely ground**, carloads, minimum weight 50,000 lb., from Annville, Donaghmore, Hummelstown, Myerstown, Palmyra and Swatara, Penn., to 58th Street Station, Philadelphia, Penn., 7½c per 100 lb. Present rate, 15c per 100 lb.

30197. **Stone, natural** (other than bituminous asphalt rock), **crushed**, carloads (See Note 2). Proposed rate, from Marlboro, N. Y., to Chester, Goshen, Kipps, Neely Town, Orange Farms, Florida, N. Y., $1; Big Island, Pine Island, Howells, Otisville, Graham, Circleville, Bullville, Thompsons Ridge, Van Keurens and Pine Bush, N. Y., $1.10; from Tompkins Cove, N. Y., to Chester, N. Y., $1; Goshen, Kipps, Neely Town, Orange Farms, Florida, Big Island, Pine Island, New Hampton, Middletown, Howells, Otisville, Circleville and Bullville, N. Y., $1.10; Graham, Port Jervis, Tompsons Ridge, Van Keurens and Pine Bush, N. Y., $1.20. Rates in cents per net ton.

30167. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Philadelphia, Penn., to Lebanon, Penn., $1.10 per net ton.

30138. **Crushed stone**, carloads (See Note 2), from Blue Mount, Md., to W. B. & A. E. R. R. stations, Annapolis to Washington, D. C., $1.20 per net ton.

30210. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Morrisville, Penn., to Refton, Penn., $1.25, and Quarryville and Florin, Penn., $1.40 per net ton.

30211. **Common sand**, other than blast, engine, fire, foundry, glass, molding, quartz, silex or silica, carloads (See Note 2), from Perth Amboy district, N. J., to stations on L. V. R. R., Black Creek Jct., to Gerhards, Penn., $1.20; Stewarts, Penn., to Quakake, Penn., $1.30; Weatherly, Penn., to Beaver Meadow, Penn., $1.20; Beaver Meadow, Collier, Penn., to Beaver Brook, Penn., $1.30; Ashmore, Penn., $1.20; Almonry, Penn., to Girardville, Penn., $1.30; Ashland, Penn., $1.40; Raven Run, Penn., $1.30; Montana, Penn., $1.40; Midvalley No. 2, $1.30; and Centralia, Penn., to Mt. Carmel, Penn., $1.40 per net ton.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason—Proposed rates are comparable with rates on like commodities for like distances, services and conditions.

30143. **Crushed stone**, carloads (See Note 2), from York, Penn., to Baltimore, Md., 90c per net ton.

30254. **Sand**, other than blast, core, engine, fire, glass, grinding, molding, quartz, silex or silica, and **gravel**, carloads (See Note 2), from Machias and Springville, N. Y., to points in the state of Pennsylvania, Bingham, Johnsonburg, Falls Creek, Curwensville, Rossiter, Cummings, Iselin, Indiana, Josephine, Vintondale, Pine Furnace, Lucasville, Butler, Lafayette, Shippenville, Petrolia, Callery, Wharton, Medix Run, DuBois, Onondaga, Sagamore and various. Rates ranging from 90c to $1.60 per net ton.

30260. **Crushed stone** (not coated), carloads (See Note 2), from LeRoy, N. Y., to Pine City, Seeley Creek, Millerton, N. Y., Trowbridge, Penn., $1.20; Covington, Penn., $1.30; and Blossburg, Morris Run, Arnot, Landrus, Morris and Hoytville, Penn., $1.40 per net ton.

30263. **Stone, crushed or broken**, carloads (See Note 2), to N. Y. O. & W. Ry. stations, Oswego, Fulton, Jewell, Oneida, Pratts, New Hartford, Oriskany Falls, Hamilton, Hancock, East Branch, Parksville, Luzon, Monticello, Kingston, Middletown, Cornwall, Sidney, Franklin, Delhi, Rock Rift and various. From Munns, N. Y., rates ranging from 60c to $1.60 per net ton, and from Jamesville, N. Y., rates ranging from $1 to $2 per net ton.

30185. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Philadelphia, Penn., to Conshohocken, Penn., 70c per net ton.

30280. **Granulated slag**, carloads, in open top equipment (See Note 2), from Clairton, Penn., to Everett, Mass., 21c per 100 lb.

30281. **Sand**, other than blast, engine, foundry, molding, glass, silica, quartz or silex, carloads (See Note 2), from Northeast, Md., to Columbia, Penn., 95c per net ton.

30290. **Crushed stone, stone screenings and crushed slag**, not coated, in open top equipment (See Note 2), from Buffalo, N. Y., to Burtville, Coudersport and Seven Bridges, Penn., $1.40, and Gold, Penn., $1.50 per net ton.

30296. **Sand and gravel**, carloads (See Note 2), from Hopatcong Jct., N. J., and Kenvil, N. J., to Reading company points, Phoenixville, Reading, Pottsville, Marcus Hook, Emaus, Tower City, Glenside, Bethlehem, Port Reading, Barnitz, Lurgan, Shenandoah, Pottsgrove, Gettysburg, Coatesville, Penn., Wilmington, Del., and various. Rates ranging from $1.10 to $1.75 per net ton.

30298. **Limestone** (finely ground), carloads, minimum weight 50,000 lb., from Swatara, Penn., to Manville, N. J., $2 per net ton.

30216. (A) **Crushed stone**, carloads, (B) **crushed stone, coated with oil, tar or asphaltum**, carloads (See Note 2), from Jamesville, N. Y., to N. Y. C. R. R. stations, Lawrenceville, Elkland, Westfield, Tiadaghton, Jersey Mills, Jersey Shore, Newberry Jct., Penn., and various. (A) Rates ranging from $1.50 to $1.90 per net ton and (B) rates ranging from $1.60 to 2 per net ton.

30217. **Sand** (other than blast, engine, foundry, glass, molding, quartz, silex or silica), carloads (See Note 2), from Steelton, Penn., to Biglerville, Penn., 85c per net ton.

30218. **Limestone**, carloads (See Note 2), from Richville, N. Y., to Piercefield, N. Y., $1.70 per gross ton.

30156. **Crushed stone, gravel** (other than molding), **pebbles** (other than flint or grinding), **sand** (other than blast, engine, filter, foundry, glass, molding, quartz, silex or silica) and **slag**, carloads (See Note 2), from actual shipping points in Eastern Trunk Line territory to local destination on the L. V. R. R. within a radius of 200 mi. from shipping point, except where rates were issued to meet motor truck competition:

Miles	Rate	Miles	Rate
1 to 15	$0.60	81 to 100	$1.10
16 to 25	.70	101 to 125	1.20
26 to 40	.80	126 to 150	1.30
51 to 60	.90	151 to 175	1.40
61 to 80	1.00	176 to 200	1.50

30227. **Sand**, other than glass, in open top cars, carloads (See Note 2), from Hutchins, Penn., to Durant City, Penn., 60c per net ton.

30228. **Sand** (other than blast, engine, foundry, glass, molding, quartz, silex or silica), carloads (See Note 2), from Philadelphia, Penn., to Palmerton, Penn., $1.20 per net ton.

30232. **Engine sand**, carloads, in open top equipment (See Note 2), from Cumberland, Md., to Marion, Towson, Jessop, Mountain View, Howesville, Mattingly, Irona, Snider, Kingwood Jct., and Kingwood, W. Va., $1.30 per net ton.

30309. **Stone, natural** (other than bituminous asphalt rock), **crushed**, carloads (See Note 2), to South Utica, N. Y., from Little Falls, N. Y., and Prospect Jct., N. Y., 60c, and from Newport, N. Y., 70c per net ton.

30313. To cancel present commodity rates on **glass sand**, carloads, from Winchester, Va., to all points in Trunk Line, New England and Canadian Freight Association as published in B. & O. R. R., I. C. C. 22029, and Agent Curlett's Westbound Commodity Tariff I. C. C. A-306 to C. F. A. territory account being obsolete.

30315. **Ground limestone**, carloads, minimum weight 50,000 lb., from Knickerbocker, Howellville, Rambo, Plymouth Meeting, Bluebell, Devault and Swedesford Road, Penn., to Cumberland, Md., 14½c; Carlisle, Penn., 11½c, and South Winchester, Va., 17½c per 100 lb.

30317. **Limestone, unburned, ground**, carloads, minimum weight 50,000 lb., from Rosendale to New York Lighterage (within free lighterage limits New York Harbor), $2 per net ton.

30333. To establish the same rate from McAfee, N. J., to points in Trunk Line territory on **limestone, ground, precipitated and pulverized, and limestone dust**, carloads, minimum weight 50,000 and 60,000 lb., as shown in L. & H. R. Ry. I. C. C. No. A-1802 as are now published from Atlas, Hamburg and Lime Crest, N. J.

30341. **Granulated slag**, carloads (See Note 1), from Bessemer, Homestead and Wylie (Clairton), Penn., to Rosendale, N. Y., $2.80 per net ton.

30084. **Crushed or ground slate**, carloads, from Advance and Gladhill, Penn., to Cliquot, Millis and East Walpole, Mass., 22½c per 100 lb.

CENTRAL FREIGHT ASSOCIATION DOCKET

34032. To establish on **crushed stone and agricultural limestone**, in open top cars, carloads, from McVittys, O., to Fremont, 75c, and to Millbury, O., 80c per net ton, plus emergency charge. Present, 13c to Fremont and 14c to Millbury, O.

34043. To establish on **sand**, except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica, and **gravel and slag**, carloads, from Hamilton, O., to Selma and Cedarville, O., rate of 80c per net ton. Present, 150c.

34292. To establish on **sand** (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and **gravel**, carloads, from Cleveland, O., to Bergholz, O., rate of 105c per net ton, plus emergency charge.

34294. To establish on **sand and gravel**, in closed equipment (other than box cars), carloads, from and to points in Ohio, the same as applicable when in box cars, plus emergency charge.

34060. To establish on **crushed stone**, carloads, from Melvin, O., to Coney Island, Forestville, 90c; Summerside, Hamlet, 95c; Bethel, 100c; Russellville, Felicity, O., 105c per net ton.

34149. To establish on **sand and gravel**, carloads, from Martins Ferry, O., to Amsterdam, 80c; Augusta, 85c; Apex, 75c; Bergholz, 80c; Hopedale, 70c; Mechanicstown, 85c; Piney Fork, O., 70c per net ton, plus emergency charge.

34241. To establish on **sand and gravel**, in open top equipment, carloads, from Cleveland, O., to Ashland, O., rate of 90c per net ton, emergency charge not included.

34242. To establish on **sand and gravel**, carloads, from Newtown, O., to Cincinnati, O. (for connecting line delivery), rate of 40c per net ton. (Gravel Pit, O., rate under intermediate application, per N. & W. Ry. Tariff I. C. C. 8626.)

34243. To establish on **sand** (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam or silica), carloads, from Ft. Wayne, Ind., to Cincinnati, O., rate of 135c per net ton, plus emergency charge.

34257. To establish on **crushed stone, agricultural limestone and agricultural limestone screenings**, in open top cars, carloads, from Carey, O., to Newcomerstown, O., rate of 125c per net ton, plus emergency charge.

34260. To cancel rates on **sand, blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica**, carloads, from Meadville, Penn., to points in official classification territory, as published in B. & L. E. Tariff I. C. C. Nos. 907 and 942, and Erie R. R. Tariffs I. C. C. Nos. A-6780 and A-6885, account obsolete.

34256. To establish on **stone, crushed, stone screenings**, in open top cars, carloads, from Carey, O., to Uhrichsville, O., rate of 125c per net ton, plus emergency charge.

34321. To establish on **quarry scrap or tailings**, carloads (See Note 1), from Walford and Hillsville, Penn., to Detroit, Mich., rate of 160c per net ton. Present, 21½c.

34355. To establish on **crushed stone**, in bulk in open top cars, carloads, from Ridgeville, Ind., to Dunkirk, Mill Grove, Hartford City, 40c; Upland, Ind., 50c per net ton, plus emergency charge (reduction).

34358. To establish on **crushed stone, crushed screenings, agricultural limestone**, in bulk in open top cars, in straight or mixed carloads, from Centerville, O., to Coney Island, Forestville, 90c; Summerside, Hamlet, 95c; Bethel, 100c; Russellville, Felicity (F. & B.), O., 105c per net ton, via P. R. R., Carrel St., O., C. G. R. R. (reduction).

34371. To establish on: (1) **Ground limestone**, carloads, minimum weight 60,000 lb.; (2) **crushed stone, coated with tar, oil or asphaltum**, carloads; (3) **crushed stone and screenings**, carloads, from Shaw Jct., Penn., to: (1) New York, Pennsylvania, Maryland and West Virginia points; (2) New York, Ohio, Pennsylvania and West Virginia points; (3) Pennsylvania instrastate points, on basis of the mileage scales.

34406. To establish on **sand and gravel**, all kinds, carloads (reduction in most cases). Rates in cents per net ton to points in Ohio:

From Newtown, O.

To	Prop.	To	Prop.
Afton	65	Mowrystown	80
Batavia	60	Mount Oreb	75
Beaver Pond	95	New Boston	105
Bodman	75	North Kenova	125
Ceredo, W. Va.	125	Otway	100
East Danville	85	Peebles	90
Eastwood	70	Perintown	60
Gernon	60	Portsmouth	105
Hillsboro	90	Sardinia	80
Kenova, W. Va.	125	Seaman	85
Kingston	135	Taylorsville	80
McDermott	115	Williamsburg	65
Macon	80	Winchester	85

From Gravel Pit, O.

To	Prop.	To	Prop.
Kingston	135	New Boston	105

Route—Via N. & W. Ry. direct.

ILLIONS FREIGHT ASSOCIATION DOCKET

7037. **Sand and gravel**, carloads (See Note 3), from Shawneetown, Ill., to Illinois points (rates in cents per net ton):

To	Pres.	Prop.	To	Pres.	Prop.
Roland	76	50	Springer	80	60
Norris City	76	50	Whites Siding	80	60
Sacramento	76	60	Mill Shoals	80	60
Enfield	76	60			

7038. **Stone, crushed**, carloads, from Falling Springs, Ill., to Rinard, Cisne, Fairfield, Barn Hill, Norris City, Omaha, etc., Ill. Proposed, $1.01 per net ton.

5596-B. **Stone**, as described in Section 1 of I. C. R. R. Tariff 13321G, I. C. C. A10242, from Thornton, Ill., to Rockford, Ill. Proposed, $1.05 per net ton.

6025-I. **Limestone, crushed or ground**, carloads (See Note 3), from Valmeyer, Ill., to Winona, Minn., Appleton, Wis., Chippewa Falls, Wis., Eau Claire, Wis., Fond du Lac, Wis., Wausau, Wis., and Wisconsin Rapids, Wis. Rates—Present, class or combined; proposed (rates in cents per net ton), to Winona, Minn., 285; Appleton, Wis., 275; Chippewa Falls, Wis., 286; Eau Claire, Wis., 286; Fond du Lac, Wis., 265; Wausau, Wis., 285; Wisconsin Rapids, Wis., 285.

8243. **Stone, broken, crushed, ground; chatts, rubble** (rough, broken, irregular pieces, not machined or tooled), rip rap, carloads (See Note 2), but not less than 40,000 lb. per car, except that when cars of less marked capacity are furnished for the carriers' convenience the minimum will be the marked capacity of car, from Burlington, Sussex (Templeton) and Waukesha, Wis., to Minneapolis, St. Paul and Minnesota Transfer, Minn. Proposed rate, 11c per 100 lb., subject to tariff of emergency charges, Agent E. B. Boyd's Freight Tariff No. 252-A.

5319-F. **Sand, gravel or stone, crushed**, carloads, minimum weight as shown in Item No. 5 of C. B. & Q. Tariff G. F. O. No. 16830-C, I. C. C. No. 17922, between stations in Nebraska. Proposed rates: (A) extension of the expiration date from December 31, 1932, until December 31, 1933, of the present so-called emergency sand, gravel and crushed stone rates. These rates not to be subject to the emergency surcharge of 6c per ton. (B) Continuation for the year 1933 of the basis used in establishing these emergency sand, gravel and crushed stone rates, which basis is the minimum distance scale of rates shown in W. T. L. Docket Advice 5319-D and W. T. L. circular letter of January 31, 1932, file W. T. L. Docket 5319-D.

8244. **Stone, crushed**, carloads, from Knoxville, Tenn., to St. Paul, Minn. Proposed rate, 613c per net ton, plus emergency charge; carload minimum weight, 40,000 lb.

7059. **Sand and gravel**, carloads (See Note 3), from Allison Branch, Ill. Rates per net ton.

To (representative)	Present	Proposed
St. Elmo, Ill.	*	$1.13
Greenville, Ill.	*	1.26
Dexter, Ill.	*	1.10
Dennison, Ill.	*	1.26

*Classification basis.

7031. **Sand and gravel**, carloads, from Joliet, Ill., to Prophetstown and Tampico, Ill. Rates, $1.20 per net ton.

7062. **Crushed stone**, coarse, traffic bound, surface, carloads (See Note 3), but in no case will the minimum weight be less than 40,000 lb., from Joliet, Ill., and points in Joliet district to Evans, Ill. Proposed, 63 cents per net ton plus emergency charge.

7067. **Sand, gravel and crushed stone**, carloads. (Rates in cents per net ton.)

	To Belleville Prop.	To New Athens Prop.
From Krause Stolle	51	51
From East St. Louis	51	51
From East Carondelet	51	51
From Falling Springs	61	61

6180. **Sand, silica, washed or processed**, carloads (See Note 3), from Ottawa, Ill., to Knoxville, Tenn. Proposed—To publish through commodity rate on basis of the Cincinnati combination, to permit handling via C. B. & Q., Chicago, C. & E. I., Princeton, Ind., and Southern Ry.

WESTERN TRUNK LINE DOCKET

8227. **Limestone, ground**, in mixed carloads with lime, from Hannibal, Mo., to points in Western Trunk Line territory. Proposed—Publish provision that rates and minimum weight on lime will also apply on ground limestone in sacks when shipped in mixed carloads with lime.

8229. **Stone, crushed**, carloads, minimum weight, usual minimum weight, from Winona, Minn., to Wisconsin points. Representative distance rates, in cents per net ton:

Miles	Pres.	Prop.	Miles	Pres.	Prop.
5	75	46	30	80	62
10	75	50	35	85	64
15	75	52	40	85	68
20	75	56	45	90	70
25	75	58	50	90	74

8232. **Sand**, carloads, minimum weight, usual minimum weight, from Chippewa Falls and Eau Claire, Wis., to Crown Point, Ind. Proposed rate, $2.27 per ton, subject to tariff of emergency charges.

1873-P. **Sand**, carloads, as described in Item 10, W. T. L. Tariff 210, from Wichita, Kan., to Fall River, Kan., Proposed, 80c per ton plus emergency charge.

7012-1. **Sand**, ground or pulverized (silica), carloads, from Ottawa, Millington, Wedron, Utica and Oregon, Ill., to Central Freight Association, Eastern Trunk Line and New England territories. Proposed, 14½% first class, minimum 90,000 lb. Minimum weight, proposed 90,000 lb.

3089-M. **Limestone, crushed or ground**, in bulk or in bags, carloads, usual minimum weight, from Quincy, Ill., to Kansas City, Mo. Rates: Present—$1.80 per ton. Proposed—$1.50.

8209. **Stone, crushed, ground or pulverized**, carloads (See Note 2), but not less than 40,000 lb. from Quincy, Ill., and White Bear, Mo., to stations in Nebraska shown in docket advice. Rates: Present—Class or combination. Proposed—Hannibal basis as shown in exhibit to docket advice.

3234-F. **Sand (river) and gravel**, carloads, minimum weight per Item 20, W. T. L. Tariff 237, from St. L.-S. F. Ry. Stations, Pacific, Mo., to Ranken, Mo., incl., Mo. Pac. R. R. stations, Pacific, Mo., to Jedburg, Mo., incl., to stations in Missouri on connecting lines to which short distance from Jedburg makes via St. Louis, Mo. (intrastate only). Rates: Present—Actual distance from each point named with certain exceptions where specific rates are published. Proposed—Provide that rates from stations named in Section 2 to stations named in Section 3 will be arrived at on basis of the Jedburg, Mo., mileage.

8244. **Stone, crushed**, carloads, from Knoxville, Tenn., to St. Paul, Minn. Rates: Present—709c per net ton. Proposed—613c per net ton, plus emergency charge, carload minimum weight 40,000 lb.

SOUTHWESTERN FREIGHT BUREAU DOCKET

26157. **Sand and gravel**, between points in Missouri. To provide that rates on sand (river) and gravel, carloads, minimum weight as per Item 20, W. T. L. Tariff 237, from St. L.-S. F. stations, Pacific, Mo., to Ranken, Mo., inclusive, and Missouri Pacific R. R. stations, Pacific, Mo., to Jedburg, Mo., inclusive, to stations in Missouri on connecting lines to which short distance from Jedburg makes via St. Louis, Mo. (intrastate only), be arrived at on basis of the Jedburg, Mo., mileage.

32. **Silica sand**, from Wedron and Ottawa, Ill., and Brownstown, Wis., to Blackwell, Okla.: Rates of $3.32 from Wedron and Ottawa, Ill., and $3.56 per ton of 2000 lb. from Brownstown, Wis., on silica sand, carloads (See Note 3) to Blackwell, Okla. Proponent states that with the resumption of operations at their smelter at Blackwell, Okla., they shall again be purchasing carloads of silica sand.

26245. **Silica sand** (refuse), from Guion, Ark., to stations in Arkansas, Louisiana and Tennessee. To establish rates on silica sand (refuse), carloads (for manufacturing fertilizer purposes only) (See Note 3) from Guion, Ark., to points shown below, in cents per ton:

Destination	Rate	Destination	Rate
Batesville, Ark.	62	Searcy, Ark.	115
Camden, Ark.	170	Texarkana, Ark.	180
Ft. Smith, Ark.	190	Waldo, Ark.	190
Hope, Ark.	170	Shreveport, La.	205
Little Rock, Ark.	120	Memphis, Tenn.	146
Magnolia, Ark.	190		

The proposed rates are the same as applicable on crushed or ground limestone for fertilizer.

26248. **Silica sand**, from Guion, Ark., to stations in Arkansas, Kansas, Missouri and Oklahoma. To establish rates on silica sand, in box cars, carloads (See Note 3), from Guion, Ark., to points shown below:

	Rate		Rate
Sapulpa, Okla.	207	Poteau, Okla.	195
Sand Springs, Okla.	207	Caney, Kan.	195
Tulsa, Okla.	207	Fredonia, Kan.	207
Blackwell, Okla.	241	Independence, Kan.	195
Henryetta, Okla.	219	Kansas City, Mo.-Kan.	193
Muskogee, Okla.	195	Ft. Smith, Ark.	178
Okmulgee, Okla.	219		

The proposed rates are those in effect from Everton, Ark., as provided in S. W. L. Tariff 162-E.

TEXAS-LOUISIANA TARIFF BUREAU DOCKET

700-TX. **Crushed stone, sand and gravel**, carloads, from Beckman and Dittlinger, Tex., to San Antonio and Randolph Field, Tex., carloads (See Note 1), but not less than 60 tons, rate 35c per ton, from Beckman and Dittlinger to San Antonio and 45½c a ton from Beckman to Randolph Field.

Detroit Conventions Bear Fruit

Resolutions Suggest Constructive Measures to Meet Present Problems

THE IMMEDIATE RESULT of the Highway and Building Congress at Detroit last week is covered in the 23 resolutions adopted. These resolutions did not receive the unanimous endorsement of all present at the various meetings of the component associations; these resolutions are largely the work of a relatively few earnest men who spent many hours discussing their merits. They should be accepted by the rank and file of the construction industry as representative of the best thought in the industry. They constitute a platform—a definite goal to help reëstablish prosperity.

It is proposed to continue the essential part of the Congress organization—the committee of presidents and secretaries (or managers) of the various component organizations, rather than turn its future over to the Construction League of the United States, as was first proposed. Whether another Congress shall be held, and when, will depend on this committee. How effective the work of this first Congress proves depends in a very large measure on how effectively the component associations make use of its literature, its findings, its resolutions.

Resolutions Adopted

Recognizing the gravity of the existing business emergency and desiring to assist in relieving it, we, the construction industry of the United States, as represented by 21 national organizations meeting in joint session in Detroit, Mich., January 16 to 21, 1933, hereby adopt this platform of policies and measures for employment and business recovery. Construction is among the nation's largest industries and the revival of its activities will determine in large measure the recovery of prosperity. We confidently believe that general conditions are now favorable to resumption of business in its normal channels, if prompt and effective action is taken.

Dole Opposed

1. We are unalterably opposed to the dole system and strongly advocate in lieu thereof, first, an immediate constructive program of sound and needed public and semi-public improvements, and, second, the adoption of such measures as will hasten the resumption of private construction and industry. Among the public and semi-public projects are highways, waterways and other forms of transportation; flood control; housing; sanitation; waterworks; sewerage and refuse disposal; public buildings and other similar projects.

Government Economy

2. We demand maximum economy in the current administrative and operating expenses of government, as well as an increased program of public works financed out of capital account. To further this end we urge that wherever possible, the investment of the national government, states, cities and other governmental subdivisions in permanent improvements be charged into capital account as is the practice of private industry, and that only the necessary carrying charges and amortization be included in current operating budgets.

Liberalize Relief Act

3. In view of the ineffectiveness of the construction loan operations that have been carried on under the Emergency Relief and Construction Act, we advocate liberalization of self-liquidating requirements and reduction of interest rates by suitable amendments of that act.

Include Sewerage

4. We appeal to states and municipalities to enact immediately legislation that will place upon a self-sustaining and self-liquidating basis through service charges such public services as sewerage and sewage disposal.

Use Funds for Construction

5. We urge that all public agencies engaged in distributing relief funds adopt the policy of applying these funds wherever possible through planned useful work instead of through welfare doles.

Emergency Federal Aid

6. We urge the extension of the date of completion of current emergency Federal Aid highway work from July 1 to October 1, 1933.

Continue Federal Aid

7. We deplore the proposal that Federal Aid to state highway improvement be curtailed or suspended at this time, and we urge Congress to continue the Federal Aid policy by appropriating during the present emergency a sum equal to that appropriated last year, and in any event not less than the revenues from Federal taxes on gasoline and tires.

No Gas Tax Diversion

8. We demand that the revenue raised from motor vehicle fuel taxes and license fees be used exclusively for highway construction and maintenance, and we oppose the diversion of these fees and taxes to other purposes.

City Streets

9. We advocate the extension of Federal Aid to those portions of state and Federal Aid highway systems within city limits, and we recommend such allocation as will give a fair proportion of the highway funds to municipalities for streets and roads within their corporate limits.

Regulate Highway Traffic

10. We endorse the proper and reasonable regulation of highway transportation, such regulation to be premised on sound economics and not on a desire to establish parity of cost with other forms of transportation.

Housing

11. We urge that all necessary measures be undertaken to promote the construction of adequate low-rental housing and that the various states enact legislation to grant the power of eminent domain for this purpose.

Reduce Interest Charges

12. Believing that the heavy interest charges of fixed obligations are a serious obstacle to early credit restoration, we urge, as an essential of economic recovery, that interest rates on such fixed obligations be reduced and adjusted by negotiation to conform to the general price level.

Give Debtors a Chance

13. We recommend that the Federal Government and the several states amend their bankruptcy and related statutes to simplify the process of reorganizing public and private financial structures by providing that approval of a substantial majority of bond or other certificate holders shall be sufficient to authorize such reorganization.

City Taxpayers' Relief

14. We urge that state laws and municipal charters be amended to permit deferring payment for at least two years of the initial installments of special assessments upon benefited property without penalty and at moderate interest.

Uniform Mechanics Lien Law

15. We endorse the Uniform Mechanics Lien Act prepared by the Standard State Mechanics Lien Act Committee of the United States Department of Commerce and the National Conference of Commissioners on Uniform State Laws, and urge the enactment of this legislation by state legislatures.

Reduce Government Bureaus

16. We urge that the Government cease engaging in any form of business and service not clearly necessary to the administration of governmental functions.

Federal Public Works

17. We urge that the United States Con-

gress establish a national department of public works.

Organize Congress

18. In view of the vital relation of construction to public welfare, we urge that standing committees on construction be set up in both branches of the Congress of the United States, similar to those of agriculture, finance, etc., so that Congress may be enabled to act with greater knowledge and broader judgment on construction matters.

Advance Planning

19. Believing that public and semi-public works can be carried out efficiently and economically only under a coordinated and balanced program of national, state and municipal works, we urge comprehensive advance planning of public improvements accompanied by long-term financial planning as the soundest policy of conducting public works; and we recommend that legislation to carry out such policy be enacted.

General Sales Tax

20. We favor the enactment of an emergency general sales tax as a means of reducing other forms of taxation and furthering the program of public and semi-public improvements that we advocate.

Construction Currency

21. We recommend that if further financial measures are found necessary to restore employment and value, consideration be given by Congress to the establishment of a rigidly controlled increase of circulation by issue of currency based on labor and materials actually expended in useful construction, such currency to be issued only as compensation for work completed.

Rehabilitation

22. To give more immediate aid to the unemployed, we urge all communities to plan and put into effect an intensive campaign of rehabilitation and repair.

Efficient Methods

23. While recognizing the urgency of reducing unemployment, we demand that public work be performed by the most modern and efficient methods, and we oppose the indiscriminate substitution of hand labor therefor.

Highway Congress

THROUGHOUT sessions of the Highway Congress, gas tax diversion was the dominating theme. The staggering extent to which diversion has been carried was vividly pictured by E. N. Smith, executive vice-president of the American Automobile Association. Today highway users pay 12% of all taxes. Ownership of an automobile has become the yardstick of taxability, he said. The amount of this taxation was given as 168% of the value of the property during the life of a car. No other class of citizens is taxed to such an extent, Mr. Smith stated.

While taxation has been great, motorists have willingly shouldered it so long as funds derived were applied for road construction. This taxation has become so great that it has resulted in decreased use of automobiles. For several years tax-spending bodies have watched these taxes and have successfully found ways to apply them to other than road building and improvement. At first this diversion was of little moment. But once diversion was started it proceeded at an appalling rate. In a very few years diversion has been applied to such diverse and unrelated uses as the propagation of oyster beds, public school operation, and construction of breakwaters.

Of greatest present concern is its application for "doles," commonly referred to as "emergency relief." Even Federal Aid, specifically authorized for construction of a unified system of public roads, is being diverted to doles. A group of educators is actively working to obtain a more general use of this potent source of funds for school purposes. Now there is a question as to whether new conditions be demanded in the administration of Federal Aid, and if new conditions are required, what they shall be.

The importance of roads as an economic necessity was emphasized by T. H. MacDonald, chief, U. S. Bureau of Public Roads. Movement of produce from 6,000,000 farms depend on public roads. Dependable highways have increased social and educational advantages to rural advantages.

Mr. MacDonald urged that wasteful governmental expenditures be distinguished from investments in economic improvements; that "every item of expenditure that cannot stand on its own merits be eliminated."

In this regard he pointed to the important position road construction has played as a factor in employment, thus showing the vital need for continuing this work to maintain employment. In 1932 approximately 50% of the cement production and between 70 and 75% of the crushed stone, sand and gravel produced was used in road and street construction and maintenance activities. Asphalt and asphaltic oils, steel, lumber, fuel, equipment manufacturers, rail transportion and many others, all participated to an important degree in business resulting from this source.

In order to preserve that which has been created, and to further extend the resulting benefits of transportation improvement, "a utility which yet fails to meet the public demand in every section of the country," he congratulated the construction industry on its cooperative efforts to stimulate economic recovery by preventing a breakdown in sound highway administration policies.

After emphasizing the importance of a unified construction industry to obtain deserved consideration for construction programs, W. T. Chevalier, publishing director, civil engineering publications, McGraw-Hill Publishing Co., reviewed road development to its present position as an artery of transportation.

Not only do roads pay their own way; they pay a profit as well, he said. Federal Aid highways unquestionably are "self-liquidating" projects, and are paid for by the users. He urged that taxation to further increase the cost of transportation be opposed and that highway revenues be conserved for highway purposes.

Albert L. Worthen, President, National Crushed Stone Association

Martin L. Pulcher, National Automobile Chamber of Commerce, Washington, D. C., stressed the importance of highway transportation to economic recovery. Chester H. Gray, American Farm Bureau Federation, Washington, D. C., describing the farmers' interest in adequate highways, emphasized secondary highway improvement—the farm to market roads. Grover C. Dillman, state highway commissioner of Michigan, speaking on a balanced highway program, brought out the necessity of planning based on traffic surveys.

Aggregate Producers' Conventions

NO ATTEMPT will be made to give a complete or chronological report of the two separate simultaneous conventions of the National Crushed Stone Association and the National Sand and Gravel Association. Most of the papers and discussions were equally interesting to producers of either type of aggregate; and the pity is that they could not be in both meetings at the same time. Only the high lights of the two conventions on subjects of general interest are given here.

Business Conditions

Each convention opened with a recital by prominent producers of present conditions and the prospects. These differed little from the summary given in the Annual Review Issue of Rock Products, December 31, 1932. With few exceptions the picture presented was not a cheerful one. Reports of directors of the National Crushed Stone Association showed losses in production in 1932 as compared with 1931, ranging from 16 to 50%; prices in practically every instance were also lower, and although costs of production have been cut an average of about 25%, few producers could show a profit. There was not much in the outlook for 1933 except such highway construction as could be realized in spite of gasoline tax diversion and various misguided efforts of the national and local governments to economize in this field of activity. Competitive conditions have been very bad except in a few localities where producers have been sensible enough to attempt to maintain prices which at least return costs.

George E. MacIlwain, business economist, lecturer, author and analyst, Boston, Mass., speaking on the National Crushed Stone Association program on the business outlook, said in substance that the low point in general business was passed last July; that there had been nothing abnormal, nothing to be alarmed about in the situation, since then. Improvement, he said, is on the way, but will be slow and cautious. The outlook for public works, he thought, was not bright; that extensive readjustments are called for; that the agitation to reduce public expenditures will adversely affect public works construction for a long time. He proudly exhibited a badge of the National Economy League, of which he said there were already nearly a million members in Massachusetts alone, the object of which is to reduce governmental expenditures.

The reports of sand and gravel producers were a little more constructive because they described ways and methods of reducing operating costs. Local pit competition was frequently mentioned as a serious factor in competition. Production decrease in 1932 as compared with 1931 appears to have been about the same as in the case of crushed stone. Power costs are an increasingly important element with intermittent operation of plants. Aside from savings in labor costs, the biggest savings have been made in power costs. This has been done through greater use of Diesel engines, especially on all floating equipment. Where capital can be had it was acknowledged that there are numerous instances where Diesel-electric generating plants for home-made power are desirable; in other instances the power companies have recognized this and have substantially reduced rates. Where operating separate excavating units, such as dredges, with purchased electric power, savings have been effected in both labor and power costs by operating the dredge only, storing the raw material between pit and plant; then ceasing dredging operations and processing the stored material, using the same operating crew. This cuts down the demand charge for power and cuts labor costs as well. There was general agreement that any new plants built, although no one could see necessity for any, should be small ones, even in metropolitan markets.

Harold V. Owens, President, National Sand and Gravel Association

Wayside Pit Competition

A last minute change in the programs permitted the sessions for discussion of local pit competition to be thrown together—for the first time in history, sand, gravel and crushed stone producers met together and discussed a mutual competitive problem.

A. T. Goldbeck, director of the bureau of engineering, National Crushed Stone Association, opened the discussion by reviewing the elements which have influenced competition in the industry—the constantly increasing mileage of surfaced roads, the use of pneumatic-tired trucks and greater speeds, giving constantly a greater operating radius to the wayside pit. Also the recent tendency to build secondary roads, or traffic-bound type, where generally a lower grade aggregate is considered satisfactory. Freight rates are of course a very important factor. Some of the arguments to be used against wayside pit materials, he said, were: that specifications should be the same as for commercial aggregates; specifications should be enforced, there being always a tendency to leniency in the case of local materials; the service the commercial producer renders and wayside operator cannot render should be emphasized; when local materials are used the railways are deprived of necessary traffic; when local materials are used the quality of the highway is affected.

Mr. Goldbeck suggested several methods of combating local pit competition: (1) The "Missouri plan," described in detail in Rock Products, December 31, 1932, which, briefly, depends on a three-cornered contract between the state highway commission, the railways and the producers, through which the state agrees to purchase commercial material for certain projects, the railways agree to a rate reduction, the producers to establish a fixed maximum price; (2) get the railways to make individual voluntary rate reductions to meet competition in specific instances; (3) make more rigid specifications than local plants can meet; (4) decentralize present commercial operations; (5) add semi-portable plants to the equipment of the commercial producers; (6) more strict enforcement of specifications.

Stanton Walker, director of the engineering and research division of the National Sand and Gravel Association, after describing the destructive nature of local pit competition, said that present specifications, because of many departures frequently allowed, give no advantage to the commercial producer, and frequently cost is in favor of the local material. Some of these temporary plants, he said, are now being oporated by experienced producers, who are specializing in this field. Mr. Walker's suggestion for meeting this competition is this: Many public officials recognize the desirability of encouraging the maintenance of established plants; they can place restrictions on the use of local pit materials; it is possible the U. S. Bureau of Public Roads could be induced to recognize such restric-

tions, based on limitations of quality and service. A proposed specification being considered, which represents the most restrictive that can be expected to be approved by the Bureau of Public Roads, reads:

"Aggregates to be used on state highway projects shall come from sources of such a nature as to insure an adequate supply of aggregates of suitable quality to permit the project to be finished on or before the completion date. Each proposal shall be accompanied by a statement of the source, or sources, of aggregates proposed for use, and the low bidder, within five days after the opening of bids, shall furnish facilities to representatives of the State Highway Department for obtaining samples from the designated sources. Such samples shall be prepared on the site of the deposit by the plant to be used for the work; the plant shall be so equipped as to insure a continuous supply of materials meeting the requirements of the specifications of the State Highway Department."

Mr. Walker said in conclusion: "After all has been said, however, I am afraid that it must be recognized that most steps taken to handicap temporary plant competition can be considered as only temporary in nature. It is difficult to demonstrate that the more or less intangible economic advantages outweigh the surface advantages. I have felt for many years that serious consideration should be given, in certain localities, to handling temporary plant competition by controlling it. It is recognized that such a procedure would necessitate the writing off of large portions of considerable investments in fixed plants, but, if that is the way out, it should be faced and faced promptly. In answer to this, however, it has been pointed out, and this point deserves careful thought, that such a procedure might dignify the standing of temporary operators and result in an irretrievable loss in prestige to the established industry."

The rest of the discussion was by producers, and in no instance did a producer suggest the desirability of going into the portable plant business. John Prince, president of the Stewart Sand and Material Co., Kansas City, Mo., described the "Missouri plan" already referred to. C. Gray, American Aggregates, Corp., Indianapolis, Ind., presented arguments designed to justify public officials in the selection of commercial materials. John Rice, Jr., vice-president, General Crushed Stone Co., Easton, Penn., sketched reasons for the development of the large commercial plant, and the factors which have recently worked against it. He was distinctly against going into portable plant operation on the part of commercial producers, believing present conditions largely temporary. J. Rutledge Hill, Gifford-Hill and Co., Dallas, Tex., thought the cooperation of established producers the most effective method of meeting portable plant competition; railway rates can be reduced; in Texas reductions of as much as 40% have been obtained in some instances; also educational work can be done with public officials. A. E. Frosch, secretary, Ohio Sand and Gravel Association, East Liverpool, Ohio, recommended a study of economics to develop the greatest good to the greatest number. Some of the things to be considered in connection with portable plant operation are: (1) an already overexpanded industry, so that the additional investment is unjustified; (2) employment is reduced; (3) the quality of material is inferior; (4) the deposits are not worked to economical depths, more farm land is rendered useless for agriculture; (5) no property taxes are paid; (6) no permanent residence of workers is established; (7) hazards to safety of workers are greater. As a cure he suggested: More severe specifications and tests for materials; establishment of prequalification for producers; a license tax for all producers; lower freight rates. Elaborating he would have a license tax based on certification of necessity; a penalty tax on wayside pits; revaluation of land used for aggregate production for tax purposes; establishment of a definite price for aggregates in Federal aid bids, as in the case of labor rates; inclusion of wages paid at roadside pits in Federal aid wage scales; a special tax on wayside pits.

Anti-Trust Law Revision

Both associations had interesting discussions on possibilities of solving competitive problems by revision of the anti-trust laws. A paper on "What revisions in anti-trust laws are necessary to permit economic planning in the sand and gravel and allied industries," by Wm. P. Belden, an attorney, Cleveland, Ohio, before the National Sand and Gravel Association, held that the Sherman anti-trust law was a bar against the recovery of prosperity and its revision is one of the most important problems of the day. After a brief history of anti-trust law enforcement and making a distinction between good "trusts" and bad ones, he predicted for the future companies of moderate size as the most efficient. Such concerns can work effectively through trade associations, but these trade associations are helpless in the most important factor of price stabilization. However, he considered repeal of the anti-trust laws not practicable at the present moment because of other pressing problems before Congress. In lieu of repeal a proposal bill is now being drafted by the commerce committee of the American Bar Association providing for filing a certificate in any given case, so that a Federal Trade Commission opinion might be substituted for the judgment of the courts, and save business executives criminal risks, subject of course to a court review. Such a measure would give greater elasticity to enforcement of the present laws.

Gilbert H. Montague, attorney, New York City, addressed the National Crushed Stone Association on: "Stabilization and the anti-trust laws," in which he gave as his opinion that problems of excess capacity and reduced demand cannot be solved under existing anti-trust laws, and that new legislation modifying the Sherman anti-trust law is essential. He advised concerted action on the part of all business men. He said the only progress that could be made would be for the various associations to agree on some plan or proposal and then get solidly behind it to obtain its passage by Congress.

Harold Williams, attorney, Boston, Mass., also urged cooperative action by producers. It was said Congress is unfavorable to early action because of the crudity of some of the proposals so far made. Mr. Montague was against price-fixing and government supervision. Mr. Williams was instrumental in drafting a resolution requesting revision of the anti-trust laws, which was adopted by the National Crushed Stone Association, but failed of adoption by the Highway and Building Congress.

Research

A good share of the time of both associations was devoted to a discussion of the value of research. At one session of the National Crushed Stone Association Maurice Holland, director, division of engineering and industrial research, National Research Council, New York City, discussed the subject in a general way as "industrial insurance." A. T. Goldbeck subsequently gave many specific instances of what the research work has meant to the crushed stone industry, both through better engineering practice and in protecting it from false conceptions. With its past experience Mr. Goldbeck concluded that the association's engineering bureau is able to be of greater service than ever before and is more needed than ever before. These views were ably supported by J. A. Rigg, general manager, Acme Limestone Co., Alderson, W. Va., who told of the very great assistance his own company had derived from Mr. Goldbeck's work. It was a result of Mr. Goldbeck's activities that his company succeeded in furnishing stone sand for lining a large tunnel on the Chesapeake and Ohio R. R., described in another paper at this convention.

At the National Sand and Gravel Association convention the subject of research was ably handled by Stanton Walker, whose report on his activities covered many pages, which will be reviewed later.

Plant Valuation

George D. Bailey, Ernst and Ernst, accountants, Detroit, Mich., discussing at the National Crushed Stone Association convention: "The readjustment era—its relation to plant value," said that while plant values have changed from former book values, and some companies began changing values in 1931, writing down book values, he thought today's values too low and must not generally be reduced. Such value must be based on what a plant can earn, or what can be obtained from the equipment. He said obsolescence often is greater than depreciation; normal obsolescence has been neglected

for four years, hence much machinery is used because it is on the job rather than because it is efficient. Recent economic trends have hastened obsolescence of many plants. Psychologically, he said, it is better to charge off old values, but plant revaluation cures nothing, merely sets up the plant on a better basis. Not all plants, only a few perhaps, should have valuations adjusted, not if they now have a fair value, depending on conditions and prospects. Wm. E. Hilliard, general manager, New Haven Trap Rock Co., New Haven, Conn., an accountant of much experience, expressed the opinion that now is a good time to write down assets to a basis of true value based on earning power.

Railway Ballast

H. R. Clarke, engineer, maintenance of way, Chicago, Burlington and Quincy R. R., Chicago, Ill., discussing before the National Sand and Gravel Association the "prospects for a ballast market in 1933," was not very encouraging. He said that whereas between 25 and 30 million cubic yards of ballast are required every year for maintenance under normal conditions the loss of traffic to the railways has had the effect of reducing the demand for ballast. Lighter loads and less frequent use of tracks requires less ballast, so that even had the railways funds to spend for ballast only about 9 million cubic yards would be required annually under present operating conditions. He said that a 10% increase in railway revenue would result in a more than 10% increase in maintenance of way expenditures because of neglected maintenance; nevertheless the railways can carry on for some time more without further expenditures.

Officers Re-elected

Both the National Sand and Gravel and the National Crushed Stone Associations re-elected their officers for another year: Harold V. Owens, president of the Sand and Gravel Association, and Albert L. Worthen, president of the Crushed Stone Association.

Joint Exhibit

Allen-Sherman-Hoff Co., Philadelphia, Penn. Shroud of pump after handling 50,000 tons of gravel and testimonial letters. Representatives: F. B. Allen, N. A. Neville, and W. W. Moore.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Small suspended vibrating screen, texrope drive and operating pictures. Representatives: Abe Goldberg, Henry Schaub, J. C. Collier, I. K. Cox, C. M. Davis, and E. E. Ellis.

American Manganese Steel Co., Chicago Heights, Ill. Feature was panels showing telegrams expressing good will and telling of satisfactory service of "Amsco" pumps; also letter from and picture of Halloway Gravel Co. operation. A 12-in. type H form 40 pump accurate in every detail on a ½-in. scale was also shown. This model has been shown at every annual convention since 1924. So much interest was shown in the first display that the manufacturers' division of the Sand and Gravel Association was organized and manufactures exhibits have been a part of the annual meetings since.

Blaw-Knox Co., Pittsburgh, Penn. Samples of materials treated and untreated with deduster; photographs of buckets, asphalt plants and ready-mix equipment. Representatives: N. F. Dorfan, A. A. Levison, M. S. Zimmelman, E. M. Ornitz, C. H. Lehman, B. Cochrane, and W. Powley, Jr.

C. G. Buchanan Co., Inc., Birdsboro, Penn., Miniature model of double acting jaw crusher as designed and built by Birdsboro, and photographs. Representatives: J. E. McCauley, G. H. Keppel, L. D. Bradbury, E. F. Peterson, and Geo. W. Flounders.

Bucyrus-Erie Co., So. Milwaukee, Wis. Guessing contest on weight of crushed stone and sand mixed together in irregularly shaped container. Miniature models of "Red Arch" dragline bucket, walking dragline and shovel, and many illuminated views of shovels in operation. Representatives: P. H. Burkhead, F. O. Wyse, W. M. Bager, E. G. Lewis, and R. H. Conant.

Burton Explosives, Inc., Cleveland, Ohio. Literature. Representatives: M. S. Kincaid, F. B. Harlan, R. F. Kelly, W. O. Dunn, and F. J. Griswold.

Cross Engineering Co., Carbondale, Penn. Large size samples of screens. Representatives: H. S. Woodward and J. H. Fulkerson.

Crucible Steel Co. of America, New York, N. Y. Featured "Crusca" detachable bits and shanks; also showed many types of regular drills of crucible steel. Representatives: Walter Van Cleve and J. M. Hager.

E. I. du Pont de Nemours and Co., Wilmington, Del. Miniature operating model demonstrating underfill method of settling highway fill so hard-surfaced roadway can be placed without rapidly breaking down. Representatives: S. R. Russell, L. F. Livingston, E. D. Wolf, John Koster, and W. W. Phillips.

Eagle Iron Works, Des Moines, Iowa. Miniature cutting ladder of latest design and pictures of plant installations. Representatives: C. B. Laird, Theodore Aulmann, and O. G. Du Puis.

Frog, Switch and Manufacturing Co., Carlisle, Penn. A full size bucket and various shovel parts of manganese steel. Representative: R. M. Murdock.

General Electric Co., Schenectady, N. Y. G-E arc welder, miniature broadcasting station, and new G-E gear motor. Representatives: L. W. Shugg and K. H. Runckle.

Hardinge Co., York, Penn. Miniature constant weight feeder, spiral clarifier and conical scrubber installed in miniature plant; also pictures of classifiers in operation. Representatives: F. E. Finch, G. F. Metz, and C. W. Ankeny.

Hendrick Manufacturing Co., Carbondale, Penn. New Hendrick plant testing screen, hand testing screens, samples of large screens, and buckets. Representatives: Bruce G. Shotton and D. M. Blackburn.

Hercules Powder Co., Wilmington, Del. Ingenious moving sign reading "Hercules explosives unexcelled for quarrying and road fill." Representatives: Theodore Marvin, J. Barab, Leroy Keane, Wm. Anderson, and W. B. Lyon.

Jaeger Machine Co., Columbus, Ohio. Movie showing "Jaeger" truck mixing equipment being used for placing both commercial work and pavements. Representatives: A. S. Millikan, H. C. Fraas, H. L. Bachman, A. R. Johnson, E. J. Scheuerman, Lionel Gardner, H. B. Hayden, and C. C. Reardon.

Kennedy-Van Saun Manufacturing and Engineering Co., New York, N. Y. Laboratory crusher with built-in synchronous motor of same construction as large crusher. Representatives: F. O. Reedy and T. J. Shearer.

A. Leschen and Sons Rope Co., St. Louis, Mo. Samples of regular, high strength and lock wire types of wire rope. Representatives: E. E. Hickok, Arnold Walters, and E. J. Schillinger.

Link-Belt Co., Chicago, Ill. Vibrating screen, speed reducers, log washer and classifying cone. Representatives: C. S. Huntington, H. L. Strube, Jesse Richards, George Paige, and W. L. Hartley.

Ludlow-Saylor Wire Co., St. Louis, Mo. All types of screens on revolving panel. Representatives: F. B. Unger and D. I. Meier, Jr.

Manganese Steel Forge Co., Philadelphia, Penn. "Rolman" double and fine mesh screen cloth, welding rods and samples of welding, manganese steel chain, links, pins and bushings, and examples of machined bolts, pins, etc., showing what is being done in finishing manganese steel parts. Representatives: W. H. Potter and M. S. Dennet.

Marion Steam Shovel Co., Marion, Ohio. Illustrations of shovels in operation. Representatives: L. G. Uhl, D. L. Cheney, E. R. Wilson, Carl Fries, L. S. Shaffer, H. T. Gracely and D. J. Shelton.

Morris Machine Works, Baldwinsville, N. Y. Miniature pump and certificate of honor for V. J. Milkowski as "Depression Buster." Representatives: V. J. Milkowski, M. J. Kepler, and J. E. Walsh.

Niagara Concrete Mixer Co., Buffalo, N. Y. 4 x 14-ft. "Mogul" screen, 2 x 12-ft. screen for sand producers, centrifugal sand washer, gyrating tube scrubber, laboratory testing unit and industrial screening unit. Representatives: S. D. Wettlaufer, W. G. Parks, A. E. Fielding, J. W. Morrissey, A. E. Owen, and H. W. Haapanen.

Nordberg Manufacturing Co., Milwaukee, Wis. Miniature cone crusher and sectional miniature of cone crusher and new "short head" crusher. Representatives: J. M. Thistlewaite, Delbert Kay, and A. P. Colby.

Ohio Power Shovel Co., Lima, Ohio. Small type 601 1½ cu. yd. shovel with large scale illustration of complete machinery; also small model showing application of roller bearings and helical cut gears. Representatives: R. K. Wills, and John Raugh.

Pit and Quarry, Chicago, Ill. Representatives: S. A. Phillips, W. E. Trauffer, W. E. Coats, and W. A. Buschman.

Robins Conveying Belt Co., New York, N. Y. Full size "Gyrex," roller eccentric bearing for "Gyrex" screen, Robins-Oro feeder, belt trainer and belt idlers. Representatives: S. O. Robins, J. H. Robins, E. P. Escher, M. S. Lambert, J. F. Messiner, and R. Wisely.

Rock Products, Chicago, Ill. Representatives: N. C. Rockwood, F. S. Peters, H. O. Hayes, L. C. Thaon, and E. C. Harsh.

Sauerman Bros., Inc., Chicago, Ill. Two large plant pictures. Representatives: D. D. Guilfoil, H. A. Roe, G. H. Tompkins, J. M. Schufreider, L. E. Dierks, and J. L. Nellis.

Simplicity Engineering Co., Durand, Mich. Full size 4 x 8 vibrating screen, pictures of D'Centegrator. Representatives: O. Euler, E. Barlow, George Behnke, R. C. Johnson, Fred Buell.

Taylor-Wharton Iron and Steel Co., High Bridge, N. J. Various parts of equipment, such as shovel bucket parts, chain, etc., of manganese steel. Representatives: C. B. Andrews and H. F. McDermott.

Thew Shovel Co., Lorain, Ohio. Large photographs of shovels in operation. Representatives: M. B. Garber and C. B. Smythe.

Troco Lubricating Co., Philadelphia, Penn. Literature. Representative: Lucius Beebe.

Traylor Engineering and Manufacturing Co., Allentown, Penn. Sectional model of gyratory crusher, one half showing old type head and the other showing bell head and curved concaves. Representatives: S. W. Traylor, Jr., D. A. Cheyette, and R. R. Shafter.

W. S. Tyler Co., Cleveland, Ohio. Type 400 electrically vibrated screen, Ty-rock mechanically vibrated screen, Ty-lab testing equipment, and screens. Representatives: G. R. Delamater, Bryant Currier, Fred Braun, and Hugh Pierson.

Universal Crusher Co., Cedar Rapids, Ia. Small model "Universal" jaw crusher. Representatives: L. W. Dunlap, E. A. Velde, W. L. Harrison, Robert Conway, and Messrs. Hackney and Rosendale.

U. S. Bureau of Mines. Geophysical field laboratory. Representatives: Dr. F. W. Lee, Dr. J. W. Joyce, and Jack Thoenen.

Manufacturers of Ready-Mixed Concrete Hold Busy Sessions

THE remarkable growth of the ready-mixed concrete industry, already troubled with growing pains, was pointed out by H. F. Thomson, newly elected president, National Ready Mixed Concrete Association. In spite of winning a constantly increasing percentage of the total amount of concrete placed, overproduction with its disastrous results already is a problem of the industry. It is generally recognized that continued growth of the industry is dependent on maintenance of quality of product.

Functions of the national associations, as outined by Mr. Thomson, were: (1) Leadership in legislation, such as sales tax and building code changes; (2) exchange of information; (3) safety campaign (in St. Louis compensation insurance amounts to 5% of the payroll); (4) standardization and improvement; and (5) promotion of use of ready-mixed concrete.

A purchase specification for ready-mixed concrete as proposed by a sub-committee of

the American Society for Testing Materials, to be accepted by that society at a later date, was presented by Stanton Walker in the absence of R. B. Young. The specification, as it was read, will be submitted to a list of producers and engineers for comment, after which it will be further revised and presented to the A. S. T. M. for action in June. While a purchase specification is also being prepared by a committee of the American Concrete Institute, some members are serving on both committees, and there will be no conflicting clauses.

Clauses of interest in the specification as now proposed include admixtures, the responsibility for the use of which is placed on the purchaser of the concrete. The use of high early strength cement is provided for. Aggregate must be free of frost. Provision is made for five different methods of proportioning concrete. Definition of dry and rodded volume of aggregate is made. Fine aggregate is limited to 55% of the total. With the water-cement ratio of proportioning, a minimum amount of cement to assure durability of concrete may be specified. Coarse aggregate shall be measured by weight; fine by weight or inundated volume. Powdered admixtures must be measured by weight and liquid by weight or volume. The modern trend is toward measuring by weight.

Mixing water must be accurate to 0.5%. Provision for automatically controlling mixing time is required, with time varying according to size of mixer. Hauling time from introduction of water to discharge is limited to 1½ hr. Temperature at time of discharge shall not be less than 60 nor more than 100 deg. F.

Test samples must be taken at point of delivery at time of discharge, of ample size and at several points of the load. Number of samples is specified, and 95% of all samples tested shall be equal to 90% of strengths specified. Provision is made for retest of concrete where conditions require.

Ready-mixed concrete has been used for highway construction with considerable success in Ohio, E. D. Moyer, planning engineer, Ohio State Highway Department, reported. It has proved most valuable in widening. With the development of new equipment use in full width pavement should prove more economical. The experiences of the Ohio Highway Department have been most satisfactory as to quality of concrete, strengths exceeding minimum requirements to a considerable extent.

The manufacture of concrete in winter varies greatly with locality, Miles N. Clair, vice-president, Thompson and Lichtner Co., Inc., Boston, Mass., pointed out. General facts included in his paper were: Heating of mixing water should take care of most cases above freezing temperatures; beyond that point all materials must be heated to get 70 deg. concrete. Where 40 deg. concrete is satisfactory, heating of mixing water may suffice to 10 deg. temperatures. Accurate control of water temperature is desirable.

The use of a flame torch will increase temperatures of concrete about 10%. An objection to this method is that it may introduce oil in the concrete. The use of steam in heating aggregates makes accurate control of water difficult. In England it has been found desirable to use pre-drying. Rotary driers are now manufactured and their application may be found advantageous.

Mr. Thomson, in discussion, described experience with concrete in paving. Concrete was placed at 65 deg. with an air temperature of 32 deg. After spreading and covering, the temperature of the concrete dropped 5 deg. while air temperature dropped

H. F. Thomson, President, National Ready Mixed Concrete Association

7 deg. The following morning the temperature of the concrete had risen to 65 deg. with constant air temperature. At the end of three days the temperature of the concrete was still well above 50 deg. Little difference was noted in the surface, whether exposed, protected by burlap or straw.

Other discussion brought out that action of different cement varies considerably at different temperatures in setting, hardening and consistency characteristics; and that it is desirable and profitable under some circumstances to rent equipment to contractors. One operator has done this in several cases, the equipment being used on work as much as 250 mi. from his plant. This same plant has delivered concrete as far as 60 mi.

In the discussion of business for 1932 most operators reported a lower percentage of operating capacity but a higher percentage of the total business sold. Expectations for 1933 based on known business for the year were for lower consumption, although the possibilities for new projects is yet impossible to foresee.

The general competitive situation seemed to be largely with job-mixed concrete. High quality of product seems to be an essential point in overcoming that competition, together with service.

The average haul seems to be between 3 and 5 mi., although approximately 3 mi. would seem to apply to most plants.

The use of ready-mixed concrete is not in general use for street and highway construction, but several manufacturers report having supplied such jobs and they seem to offer excellent possibilities for further increasing volume of business.

The trend in use of agitators or truck mixers is dependent on many factors and is largely a local problem.

Several companies sell concrete on a guaranteed strength basis, and that seems the goal of all manufacturers, though it involves much educational work to effect this change where it is not an established practice.

In discussing the future for concrete, W. D. M. Allan, manager, cement products bureau, Portland Cement Association, emphasized the importance of the small job. While competition with job-mixed concrete is a factor, competition with the radio and other products is even more important.

It is the belief of Mr. Allan that business in 1933 will require even harder work than years in the immediate past called for. Then to show where the small job might fit in he outlined different projects, such as community tennis courts, swimming pools, etc., that might be self-liquidating and which can be put over. Door-bell selling has been practiced by several contractors to their profit, and ready-mixed concrete plants may advantageously work with contractors in such promotion. With general construction facing the probability of further inaction on larger projects, these small jobs become relatively more important and offer immediate opportunity for business.

A resolution was passed authorizing the association to ask cement manufacturers if the differential of 5c. per bbl. between bulk and bagged cement represented the actual difference in cost to them.

Officers elected for the coming year are: H. F. Thomson, General Material Co., St. Louis, Mo., president; Paul P. Bird, Boston Concrete Corp., Boston, Mass., and L. H. Gross, Ready Mixed Concrete Co. of Reading, Reading, Penn., vice-presidents; R. B. Young, Ontario Ready Mixed Concrete, Ltd., Toronto, Ont., Canadian vice-president; A. C. Avril, Avril Tru-Batch Concrete, Inc., Cincinnati, Ohio, secretary; J. L. Shiely, Guaranteed Concrete Co., St. Paul, Minn., treasurer; Alexander Foster, Jr., Warner Co., Philadelphia, Penn., assistant treasurer; V. P. Ahearn, Washington, D. C., executive secretary, and Stanton Walker, Washington, D. C., director of engineering.

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Contractors Enter Ready-Mixed Concrete Field in St. Louis

Concrete Sales Corp. and Contractors Material Company Each Operate a Ready-Mix Plant

TWO NEW concrete mixing plants, one in the downtown section and one farther out, have been built in St. Louis since the middle of the year. In part they are a result of the temporary shutdown of the General Materials Co. in the summer because of labor troubles and the consequent inability of contractors to obtain deliveries of concrete.

One of the new plants, that of the Concrete Sales Corp., is located at 1530 Austin street, a short distance from the site of the 3½ million dollar Municipal Auditorium and Community Center now under construction. The output of the plant is being used on this work which will include some 4000 cu. yd. of concrete in the substructure and about 30,000 yd. in the building proper.

The mixing plant includes a Blaw-Knox 2-compartment batching bin of about 50 tons capacity and a 1-yd. Koehring gasoline-engine-driven mixer. The aggregates are received by rail and truck to storage piles alongside the plant and are handled to the bin by a gasoline-engine-driven General excavator with clamshell bucket. The cement is handled in bags which are raised to the mixing floor by a small hoist.

Mixing plant of Concrete Sales Corp.

By giving the batch a 30-second mix at the plant and letting the rest of the mixing be done in the agitator type trucks during transit the plant has an output of about 350 cu. yd. of concrete in 8 hours.

Delivery of the concrete is made in four 1½-yd. Jaeger dual-mix agitator bodies mounted on Ford trucks and two 3-yd. bathtub type agitator trucks furnished by the Fred Schmidt Co., St. Louis. Two 3-yd. Jaeger units mounted on International trucks are to be added. D. M. Hollingsworth is president and general manager.

New Power Digger

An interesting piece of equipment, developed by the affiliated contracting company, is being used in excavating for the foundation piers of the Auditorium. It consists of a motor-driven auger which is handled in

Another view of plant of Concrete Sales Corp. and, at right, one of the mixing trucks

Two views of the mixing plant of the Contractors Material Co.

and out of the hole by a crane, the auger in this case being some 4 ft. in diameter and being driven through a vertical stem. The motor is mounted on top of the stem which is of a length about equal to the depth of the hole to be excavated and is prevented from turning by an extensible arm running to the crane. The auger blades are hinged so that the two sides can be dropped, being held up in digging position by a cable looped over a pin.

The crane operator lowers the rig into the hole and runs the motor for a few revolutions of the auger, then hoists it and swings clear of the hole. Another man rides the auger up, hooks a secondary cable from the crane to the cable holding up the blades of the auger and thus releases them and dumps the load to a pile alongside. The machine is particularly adapted to digging in clayey ground such as was encountered in this case and makes rapid progress. One unit is said to dig eight 35-ft. holes in a day.

Contractors Material Co.

The other plant, that of the Contractors Material Co., 4440 Fyler avenue near Kingshighway boulevard in the Tower Grove section, was put into operation last August. Lewis J. Stiers of Stiers Brothers Contracting Co. is president and general manager.

The plant has a capacity of about 350 cu. yd. of concrete in eight hours and can be operated with four men. The output is in large part taken by the affiliated contracting company and by other contractors and at present is being used principally on city paving work. It is delivered in plain dump trucks.

The aggregates are received in hopper cars over the Missouri Pacific railroad, which adjoins the plant, and are dropped from a trestle into storage piles of some 3000 tons capacity. Different grades of gravel and sand are kept separated in this storage space and are reclaimed by means of belt conveyors in a 350-ft. concrete tunnel under the piles.

Two 20-in. belt conveyors are used to carry the materials one at a time to a point about midway of the tunnel, where they discharge to a short inclined conveyor at right angles to the tunnel. This conveyor in turn discharges to a 20-in. by 185-ft. inclined belt conveyor carrying up to the top of the bins.

Each conveyor is driven by its own motor through gearing and the idlers are in part equipped with Alemite-lubricated roller bearings, furnished by the General Conveyor and Manufacturing Co., St. Louis.

The mixing plant has a Blaw-Knox four-compartment bin of about 300 tons capacity. Below this is a weighing hopper with a double-beam Fairbanks scale for weighing the aggregates. Cement is at present received in bags in box cars, stored in a warehouse alongside, and added to the mix through a small hopper alongside the main hopper.

The batched material is dropped to a 2-yd. Smith mixer which is equipped with a Koehring batchmeter set for a 2-min. mix. A 2¼-yd. batch is normally mixed, requiring a 3-min. cycle. All concrete used on city paving work is made under the supervision of an inspector stationed at the plant by the city.

An interesting detail of the mixing operation is the use of a device which was worked out at the plant to help ensure the correct amount of water. The water is measured in a tank provided with the usual water gage with graduations to show gallons and also provided with an adjustable float which shuts off the water when the desired amount is in the tank. The float is set by means of cables connected to a graduated circular dial.

The safety device consists of pins connected with the levers operating the hopper gates in such a way that the water from the measuring tank cannot be discharged to the mixer until one of the hopper gates is opened and no water can be put into the tank while it is being discharged. The cement is discharged along with the sand and part of the gravel in such a way that the flow of the remaining gravel cleans the spout of all cement.

To Handle Bulk Cement

Arrangements are now being made to handle cement in bulk. In order to do this the company has purchased railroad hopper cars and rebuilt them to include lever-operated gates at the bottom of the hoppers and a single loading opening in the center of the top cover.

The bulk cement will be discharged from the car to a 12-in. screw conveyor below the track and carried up by a 12-in. bucket elevator to a central compartment which has been added to the bin. This compartment, holding about 500 cu. ft. of bulk cement, is arranged with a gate and weighing hopper below, which will be discharged through the main hopper.

The weighing of the cement will be done with a separate Fairbanks dial scale. The hopper cars will be used as storage bins, this method being considered to be less costly than the construction of other storage bins.

Black Marbles of Arkansas

THE construction of good highways has made available black limestone, known commercially as black marble.

Detailed characteristics of the deposits, factors dealing with their economic development and the market possibilities for various products are discussed in Information Circular 3 by the Arkansas Geological Survey.

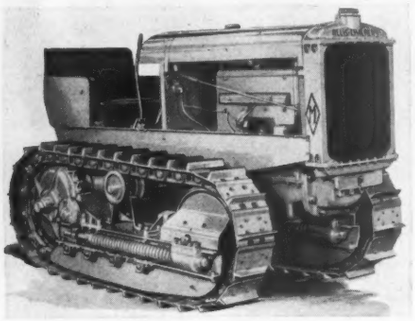
Highway Cost-Keeping

A BULLETIN which discusses uniform accounting, general requirements and purchasing equipment practices suitable for county highway construction and maintenance work has been issued by the American Road Builders' Association as Bulletin No. 30.

New Machinery and Equipment

Track Type Tractor

A NEW track type tractor is announced by the Allis-Chalmers Manufacturing Co., Milwaukee, Wis. This new tractor, the Model *"M,"* follows the general design of models "35" and *"L."* It has four speeds



Has renewable cylinder sleeves

forward, renewable cylinder sleeves, unit construction, steering clutch control and a number of other features.

This new model weighs 6200 lb., has track shoes 12 in. wide, and a draw bar pull of approximately 28 hp. It has a speed variation of from 2.23 to 5.82 mi. per hr.

•

Quarry Transportation Equipment

ADAPTING the truck to quarry requirements has been the objective of recent developments announced by the Easton Car and Construction Co., Easton, Penn. The result is two new types of truck bodies and an improved type of skip hoist car.

The "Phoenix" truck body is lined throughout with ½-in. manganese cast liners. The floor is protected by a 3-in. and the sides by a 2-in. oak cushion. The body shown is made to carry a 15 ton load delivered from a 3½- to 4-cu. yd. shovel. The combined weight of the complete truck is 30,000 lb.

This body is designed to dump to either side of the truck by an automatic dumping arrangement on the crusher floor which automatically engages the dumping bar attached to each side of the body. The truck is equipped with a special hook which cannot release itself from the body while it is in motion. The dumping device, with source of power, is furnished complete with an installation of these bodies.

The "WonWay" body is available in capacities of from 5 to 10 yd. This body can be equipped with an automatic door which opens outward and down as the body tilts, permitting free discharge. Dumping is by a self-contained hydraulic underbody hoist.

The end dump car was designed to dump into the crusher or receiving hopper with no interference from the door. The door operates with the bail, and as the car rotates into its dumping position the door is lifted clear of its load.

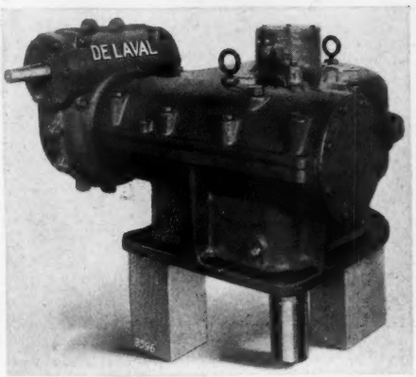
The car shown is now operating where trucks dump to it at the quarry floor, from which it carries the rock up an incline to the crusher. It is also suitable for operation all the way from shovel to crusher. It can be made in any capacity and for any gage of track. Timken bearings are furnished where desired.

•

Worm Gears for High Speed Ratios

A NEW LINE of double reduction worm gears is announced by the De Laval Steam Turbine Co., Trenton, N. J. The high speed gear wheel is mounted upon the slow speed worm shaft. A greater flexibility in the arrangement of the drive has been obtained by using separate housings for the high and low speed gears.

With the design used in this reducer there are only three moving parts, except for bearings, for transformation ratios up to 8000 to 1.



Made with vertical or horizontal shaft

Two designs are made: One with horizontal slow speed shaft; the other with vertical shaft. A considerable variety of applications are possible as a result of the design. The unit is designed particularly for continuous operation under adverse conditions of moist and gritty atmosphere and infrequent attention, and where compactness, silence and freedom from danger are controlling factors, the manufacturer states.

•

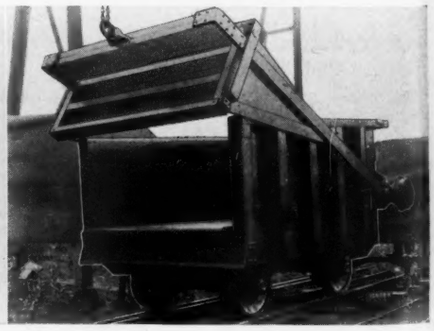
Portable Sump Pump

A NEW portable, air-operated sump pump is announced by Ingersoll-Rand Co., New York, N. Y. It consists of an open-impeller type centrifugal pump driven by a "multi-vane" type air motor and both enclosed in a one-piece housing. The unit weighs 50 lb. and is designated as sump pump size 25.

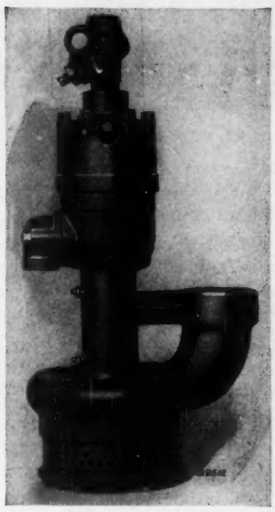
The pump will handle clear or dirty water, oil sewage, or moderately heavy sludge. It is intended for lifts of 10 to 40 ft. with air pressure of 70 to 90 lb. Using air at 80 lb. pressure, the capacity ranges from 170 g.p.m. with 10-ft. lift through 20

Door opens as body tilts

Dumps to either side



Door does not interfere



Handles moderately heavy sludge

ft. of 2½-in. hose to 125 g.p.m. with 40-ft. lift through 50 ft. of 2½-in. hose. The pump is self-priming.

●

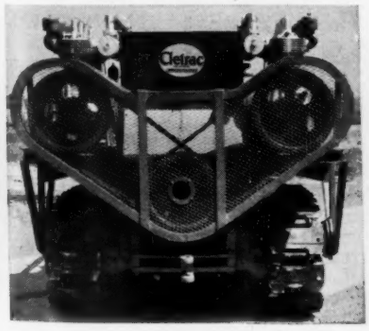
Tractor and Compressor Combined

THE Cleveland Tractor Co., Cleveland, Ohio, and the Davey Compressor Co., Kent, Ohio, announce a method of mounting a heavy-duty air compressor on the Cleveland's heaviest tractor which, it is claimed, in no way interferes with the drawbar work of the tractor. This development has resulted in a machine which combines two pieces of equipment that heretofore were sold separately. The tractor is standard, except for the specially designed mounting bracket and platform and the power takeoff.

The 4-cylinder Davey air-cooled compressors, with a combined displacement of 640 cu. ft. per min., are mounted tandem and are connected with drive sheaves by independent sets of V-type belts. A 4-in. diameter heat-treated chrome nickel steel shaft extends through the tractor, fitting into the track frame at either side, serving to carry directly the dead weight of the compressors.

The manufacturer states that vibration is practically eliminated by this type of construction and by the fact that compressor crankshafts are counterweighted and large bearing areas are provided. It is also claimed that by putting the weight of the compressor over the tracks and near the seat the equilibrium of the machine is so established that it will operate successfully at an angle of 40 deg. in any direction.

Under a test speed of 750 r.p.m. the compressors showed an efficiency of 72.5% at 100-lb. pressure; 76% at 90 lb., and 80% at 80 lb., it is said.

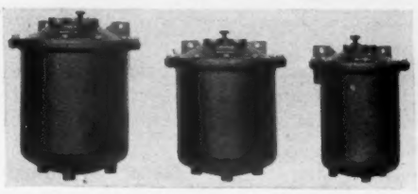


Compressor mounted on tractor

●

Full Voltage Magnetic Switches

THE General Electric Co., Schenectady, N. Y., has announced a new line of full voltage magnetic switches built to the standards of the Underwriters' Laboratories for industrial control equipment for use in Class I, Group D hazardous locations where inflammable or volatile liquids, gases, or mixtures are stored, manufactured, used, or handled. These switches are weatherproof as well as being suitable for use in corrosive atmospheres.



For hazardous locations

The new devices consist of standard General Electric magnetic switches with special operating coils and special contact tips for operation under oil, and an oil-immersed temperature overload relay.

For use in connection with these switches, a push button station, also meeting Underwriters' specifications, has been developed for remote control in Class I, Group D hazardous locations.

●

Rubber as a Noise Dampener

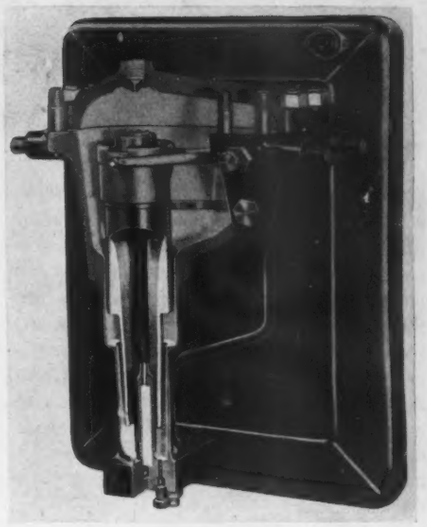
FLETCHER WALLER, research analyst on psychology, recently told officials of the B. F. Goodrich Co., Akron, Ohio, that "extensive tests have proved conclusively that noise not only reduces production but also increases workers fatigue." Rubber should find usage in many places as a noise dampener, he said.

●

Fluid Meters

A NEW LINE of fluid meters for the measurement of steam, water, gases, and other fluids is announced by the Bailey Meter Co., Cleveland, Ohio. High accuracy and dependability under severe service are provided, the manufacturer states.

Three general combinations of meters are available; indicating and integrating; recording and integrating; and indicating, recording, and integrating. The record is made in any desired units on a 12 in. diameter, 24-hr. chart. The construction is shown in the sectional view.



Measures steam, water and gases

Features claimed include permanent calibration; cases permit mounting either on the surface of a wall or panel, or flush on a panel as desired; and auxiliary recorders may be easily installed in the case to give a record of these factors on the same chart with the rate of flow. Meters are available for use under any commercial operating pressure.

●

Midwest Engineering and Power Exposition

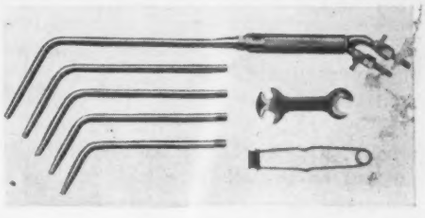
ANNOUNCEMENT is made that the sixth Midwest Engineering and Power Exposition will be held during the week of June 25, 1933, instead of February as formerly. The change has been made to enable those who attend the Century of Progress during "Engineering Week" to take advantage of this exhibit during the same period.

●

Welding Torch

THE Linde Air Products Co., New York, N. Y., has announced an addition of a new welding torch to its Purox line of oxy-acetylene apparatus. This new torch, Purox No. 20, has the same wide range of usefulness and the same efficiency and economical gas consumption as the Purox No. 20, but differs in design.

Ten one-piece, 60 deg. goose-neck tips, numbered from 6 to 15 are available for use with this torch.



Has wide range of usefulness

Sand-Lime Brick Manufacturers Hold Annual Convention

PERHAPS the most noteworthy development of the 28th annual convention of the Sand-Lime Brick Association, held in Detroit, Mich., January 17, was the firm and unanimous decision that the association continue as an active organization. This attitude is the more significant in view of the percentage of total production of the United States which was represented at the meeting. At the same time F. L. Hubbard, president, urged a united drive for members to make possible an extension of the work of the association.

Mr. Hubbard also reported progress in winning consideration of sand-lime brick on Federal construction. The present Federal specification for sand-lime brick places them on a par with clay brick, although use on particular projects must have the approval of the architect for that project. The use of sand-lime brick on the Detroit post office, now under construction, demonstrates the direct benefits of this recognition. This job will probably use a larger number of sand-lime brick than has ever been furnished on one building in the United States.

After a report of committees, Joshua Finkbeiner, Michigan Pressed Brick Co., Detroit, Mich., discussed the manufacture of sand-lime block. Such production is readily fitted in with present plants as a stripper is the only necessary additional equipment. The stripper which has been used is a machine commonly used in the manufacture of concrete blocks. Such machines can be improved to better meet the requirements of sand-lime block production. One of the most important differences in requirements is the need for stiffer pallets. It is easily possible to make a block that exceeds concrete block in strength, he said.

Because of the light color and smooth surface of sand-lime block they have an appearance of stone. Another feature of these block is that they do not check in the wall. As a result a higher price is obtained in direct competition with concrete block.

An interesting report of studies on "Injection of Sugar Into Sand-Lime Brick" was given by G. J. Cox of Mellon Institute. A series of tests was discussed showing the effect of sugar on test brick. Tests have not been sufficiently extensive to justify any conclusion as to effect of sugar on strength with various proportions of sand and lime. It is believed, from preliminary investigation, that strength may be increased when used in certain proportions. One manufacturer reported that sugar had been used in production during the past summer. Although no tests on strength were made, there was a material reduction in breakage, more than enough to offset the cost of the sugar.

Mr. Cox reports that it has been impossible to find any sugar in sand-lime brick after they have been manufactured, even with the most sensitive methods of analysis. It is possible that the sugar is thrown out in the hardening process. A noticeable odor of sugar is present in the autoclave after curing and traces of a mottled brown stain were noted on the under side of the brick after curing. There is a question, therefore, whether the sugar is thrown off in curing or whether some action takes place which is now unknown.

A valuable discussion of Detroit's new building code and its relation to other building codes throughout the country was given by Theron Tayler, Campbell Stone Co., Indian River, Mich.

Norman Hough, director, National Lime Association, also spoke on the importance of the mortar joint in obtaining satisfactory masonry construction. He urged manufacturers to call this fact to the attention of the building industry.

An exhibit of much interest was a sand-lime brick from Howard University, Washington, D. C., which had been placed in 1872. It was only recently removed.

Officers elected for the coming year are: President, F. Landon Hubbard, Michigan Pressed Brick Co., Detroit, Mich.; vice-president, W. A. Smyth, York Sandstone Brick Co., Toronto, Ont., Canada; secretary and assistant treasurer, Miss Elen Knight, Saginaw; and treasurer, J. Finkbeiner, Michigan Pressed Brick Co., Detroit. The following executive committee was named: C. H. Carmichael, Boston, Mass., chairman; J. M. Zander, Saginaw, Mich., Otto Schwartz, New Orleans, La.; H. C. Neeld, Shawinigan Falls, Que., Can.; E. W. Smythe, Madison, Wis., A. C. Kiser, Dayton, Ohio, and E. C. Boice, Pontiac, Mich.

A. C. I. Announces Tentative Convention Program

THE tentative program for the annual convention of the American Concrete Institute, to be held in Chicago, Ill., February 21-24, has been announced as follows:

TUESDAY AFTERNOON

Papers on vibration of concrete by R. E. Davis, Professor of Civil Engineering, University of California; T. C. Powers, Research Laboratory, Portland Cement Association; and Miles N. Clair, vice-president of Thompson-Lichtner Co.

Discussions by M. I. McCarty, Electric Tamper and Equipment Co.; A. W. Munsell, Munsell Concrete Vibrators; A. B. Shenk, Federal American Cement Tile Co.; G. B. Pickop, Malleable Iron Fittings Co.; A. C. Benkelman, research engineer, Michigan state highway department; F. V. Reagel, engineer of materials, Missouri state highway department; and J. F. Brett, Montreal water board.

TUESDAY EVENING

The Baha'i Temple, Wilmette, Ill., by Allen B. McDaniel, The Research Service, Washington, D. C., and John J. Earley, Washington, D. C.

Committee 409, Recommended Practice for Architectural Concrete Construction, Arthur R. Lord, Chairman. (A feature of the report will be an extensive exhibit of many panels, illustrative of the subject of the report.)

Committee 407, "Painting on Concrete Surfaces."

Brief discussions of the report by F. O. Anderegg by W. B. Roberts, Aluminum Co. of America, E. R. Bridgwater of the E. I. DuPont de Nemours and Co., Wilmington, Del., and others.

WEDNESDAY MORNING AND AFTERNOON

Trips to Baha'i Temple, the Century of Progress Exposition, and the Planetarium.

WEDNESDAY EVENING

Mass Concrete Research for Hoover Dam, by Byram W. Steele.

Cement Investigations for Hoover Dam, by Raymond E. Davis, R. W. Carlson, G. E. Troxell and J. W. Kelly.

Comparison of Cements for Heat Generation, Strength, Flow under Sustained Load, Volume Change and Elastic Properties Under Mass Concrete Conditions, by Arthur Ruettgers and R. F. Blanks.

Development of Large Calorimeter Rooms and Automatic Temperature Controls for the Adiabatic Curing of Mass Concrete, by H. S. Meissner.

THURSDAY AFTERNOON

(The Concrete Masonry Association plans sessions for morning and afternoon.)

Thermal Properties of Mass Concrete, by L. J. Snyder and C. S. Rippon.

Effect of Size of Aggregate, Size of Test Specimen and Mix Proportions on Compressive Strength, Elastic Properties and Permeability of Mass Concrete, by Arthur Ruettgers and R. F. Blanks.

Development of Apparatus and Technique for Measuring Elasticity of Mass Concrete, by Emile N. Vidal.

An 8-hour Accelerated Test for Field Concrete Control, by O. G. Patch.

FRIDAY MORNING

Selecting Plant for Mixing and Placing Concrete—Meadowbrook Hospital, by John G. Ahlers.

Some Economic Considerations of Ready-Mixed Concrete, by Herbert J. Knopel, concrete engineer, Warner Co.

Relation between Quality and Economy of Concrete, by Inge Lyse.

Institute Business—
Election of Officers.
By-Laws Revision.

FRIDAY AFTERNOON

Rigid Frame Concrete Bridges, by J. W. Beretta.

Final report Committee 105, Reinforced Concrete Column Investigation, by F. E. Richart, chairman.

Studies of the Durability of Concrete Aggregates, by H. F. Gonnerman.

Report of Committee 902, Concrete Pavement Standards, by F. C. Lang.

Construction Industry Plans More Aggressiveness

AN organized construction industry that is in a position to take united action and promote its interests was the primary purpose of the Building Congress just held in Detroit, Mich. Construction is one of the most important industries in the United States, and should be as aggressive as other industries of its size, such as farming, the railroads and the automobile.

To show what can be accomplished under present circumstances, A. E. Horst, H. W. Horst Co., Philadelphia, Penn., described the "Renovize Philadelphia" campaign. The construction industry of Philadelphia was organized and carried out a door to door sales campaign. More than $25,000,000 in business was developed.

Robert D. Kohn, general chairman, Construction League of the United States, discussed rebuilding of blighted areas. This will produce a large volume of business, it is believed. B. L. Knowles, vice-chairman, Associated General Contractors' committee on legislation, urged a public works program rather than the extravagance of a dole system. E. J. Mehren, president, Portland Cement Association, called for those important manufacturers who serve the construction industry to participate in this move for a united construction industry. Mr. Mehren was emphatic in his statement that he believed construction is the only road out of the depression. But activity is needed.

We cannot hope for any great savior to correct our present situation, said J. L. Davis, chairman of the board, Security National Bank Savings and Trust Co., St. Louis. There is only one need, that we work, and that every man have that opportunity.

Missouri Cement Bids

FOURTEEN COMPANIES bid on Missouri State Highway Department requirements for portland cement in 1933, estimated at 1,602,000 bbl.

The nine successful bidders, the quantities allotted them by the department, and the mill base prices, after deducting freight, are:

Missouri Portland Cement Co., St. Louis, 501,100 bbl., base price $1.15 from St. Louis plant and $1.25 from a plant near Kansas City, with deliveries from each about equal.

Universal Atlas Cement Co., 318,000 bbl., from plant at Hannibal, $1.15.

Marquette Portland Cement Co., 278,000 bbl., from Cape Girardeau plant, $1.15.

Alpha Portland Cement Co., 233,200 bbl., from plant in St. Louis county, $1.15.

Lone Star Portland Cement Co., 62,500 bbl., from Bonner Springs, Kan., mill, $1.25.

Dewey Portland Cement Co., 62,500 bbl., from Dewey, Okla., mill, $1.25.

Ash Grove Lime and Portland Cement Co., 62,500 bbl., Chaunte, Kan., mill, $1.25.

Hawkeye Portland Cement Co., 62,500 bbl., from Des Moines, Ia., plant, $1.25.

Pennsylvania-Dixie Cement Corp., 21,000 bbl., from Des Moines mill, $1.25 or $1.35, depending on whether Des Moines or Mason City, Ia., base was used.

These prices include 40c. for bags and 10c. discount for cash.

Sand-Lime Brick Production and Shipments in December

THE FOLLOWING DATA are compiled from reports received direct from producers of sand-lime brick located in various parts of the United States and Canada. The accompanying statistics may be regarded as representative of the industry.

Fourteen sand-lime brick plants reported for the month of December, this number being two more than the number reporting for the month of November, statistics for which were published December 31.

Average Prices for December

Shipping point	Plant price	Delivered
Dayton, Ohio	$ 9.00	$10.00
Detroit, Mich.	10.00	11.50
Flint, Mich.	11.50	13.00
Grand Rapids, Mich.	.....	12.50
Madison, Wis.	.....	13.00
Medfield, Mass.	8.00	9.00-10.00
Milwaukee, Wis.	7.50	10.50
Mishawaka, Ind.	8.25	.....
Saginaw, Mich.	10.00	.....
Sebewaing, Mich.	11.00	.....
Toronto, Ont., Can.	12.00	13.50

Statistics for November and December

	†November	*December
Production	900,500	797,500
Shipments (rail)	.....	82,000
Shipments (truck)	1,231,330	883,725
Stocks on hand	4,476,561	4,792,426
Unfilled orders	8,050,000	5,755,000

*Fourteen plants reporting; incomplete, three not reporting unfilled orders.

†Twelve plants reporting; incomplete, three not reporting unfilled orders.

Concrete Paving Yardage

CONCRETE PAVEMENT yardage as awarded in the United States during December and for the period ending December 31, as reported by the Portland Cement Association, follow:

	Sq. yd. awarded during December, 1932	Total sq. yd. awarded for year to Dec. 31, 1932
Roads	4,638,047	86,393,986
Streets	999,352	10,094,222
Alleys	11,972	339,269
Total	5,649,371	96,827,477

Portland Cement Production

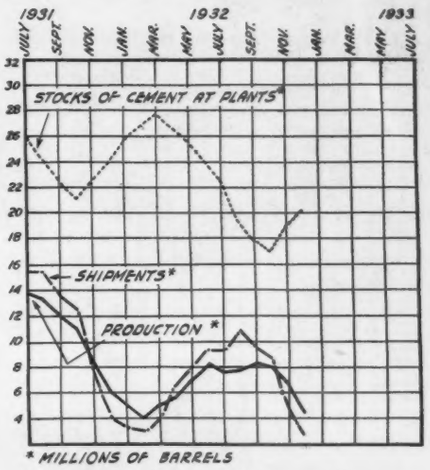
PORTLAND cement industry in December produced 4,248,000 bbl., shipped 2,835,000 bbl. from mills, and had in stock at the end of the month 20,200,000 bbl., the Bureau of Mines reports.

The December production showed a decrease of 28.9%, shipments a decrease of 31.6%, and stocks at the mills were 16.4% lower as compared with a year earlier.

Preliminary totals for 1932 showed decreases of 39% in production, and 36.6% in shipments as compared with 1931. Shipments from mills in 1932 amounted to 80,579,000 bbl., with estimated factory value of $80,835,000.

RATIO (PER CENT.) OF PRODUCTION TO CAPACITY

	December 1931	December 1932	Nov. 1932	Oct. 1932	Sept. 1932
The month	26.4	18.5	29.1	34.6	36.9
12 months ended	46.5	28.3	29.0	29.6	30.6



Portland cement production to Dec. 31

Distribution of Cement

The following figures show shipments from portland cement mills distributed among the states in barrels:

Shipped to	October 1932	November 1931†	November 1932
Alabama	27,450	26,640	46,722
Alaska	264	1,634	528
Arizona	15,107	16,951	11,747
Arkansas	22,307	65,442	24,462
California	376,227	469,082	368,806
Colorado	38,567	38,269	30,044
Connecticut	71,770	115,392	55,588
Delaware	26,516	18,165	28,807
District of Columbia	113,725	95,373	88,796
Florida	37,713	37,636	31,192
Georgia	126,372	127,940	96,639
Hawaii	25,189	21,443	14,050
Idaho	12,068	9,045	6,095
Illinois	694,419	405,403	272,348
Indiana	344,533	137,557	76,993
Iowa	454,027	75,128	86,539
Kansas	120,451	85,678	79,749
Kentucky	228,086	91,585	85,261
Louisiana	174,155	259,759	108,552
Maine	27,528	24,207	15,169
Maryland	140,141	198,274	101,789
Massachusetts	161,602	229,878	132,313
Michigan	501,301	191,085	94,471
Minnesota	232,531	90,893	35,044
Mississippi	45,566	15,502	42,922
Missouri	370,436	226,333	153,983
Montana	16,038	9,526	5,997
Nebraska	149,984	51,644	49,924
Nevada	59,278	14,728	61,177
New Hampshire	52,384	30,201	26,044
New Jersey	272,420	397,146	178,586
New Mexico	16,950	11,907	12,752
New York	1,128,337	1,223,494	623,446
North Carolina	32,846	54,884	30,813
North Dakota	28,437	6,152	3,590
Ohio	586,904	371,566	248,100
Oklahoma	116,502	123,866	119,817
Oregon	47,454	52,625	19,121
Pennsylvania	491,038	526,424	376,978
Porto Rico	9,875	9,238	6,850
Rhode Island	39,206	35,655	19,307
South Carolina	14,526	165,616	10,783
South Dakota	77,355	14,179	6,325
Tennessee	121,927	128,207	111,559
Texas	372,878	368,199	363,185
Utah	26,380	12,860	20,118
Vermont	17,857	15,714	7,026
Virginia	72,578	116,823	57,857
Washington	90,017	71,142	45,327
West Virginia	72,893	83,257	43,485
Wisconsin	290,171	153,150	87,968
Wyoming	10,954	4,891	6,011
Unspecified	109,019	.....	101,193
	8,712,250	7,127,388	4,732,008

THE INDUSTRY

Incorporations

Lawrence Quarries, Inc., Trenton, N. J., 10 ares common.

Midwest Sand and Gravel Co., Minneapolis, Minn., $100,000.

Wallin Concrete Corp., New York City, 100 shares common.

Baton Rouge Gravel Co., Inc., Baton Rouge, La., $20,000.

C. M. Johnson Sons Sand and Gravel Co., Inc., Helena, Ark., $100,000.

Newport Sand and Cement Corp., Rochester, N. Y., 200 shares common.

Southwest Lime Co., Seneca, Mo. A. L. Hunt, Neosho, Mo., and R. W. Hunt.

Dudley Stone Products Co., Inc., Santa Fe, N. M., $100,000. Jose D. Fernandez.

Lehr Brothers, Inc., Dover, Del., 1,000 shares common. Silica sand, kaolin clay, etc.

Missouri Maphite Products Co., Inc., St. Louis, Mo. J. S. Lehmann, Merchants Laclede Bldg.

Superior Block and Builders Supply Co., Miami, Fla. E. H. O'Neal, 512 N. E. 57th St., and P. G. O'Neal.

Electro Lime and Ice Corp., Bellefonte, Penn., 500 shares common. To manufacture lime and carbon dioxide from limestone.

Ferryview Sand and Gravel Co., Inc., Pontiac, Mich., $5,000. Joseph Bauman, Rochester and Bauman Rd., Clawson, Mich.

Dixie Sand and Gravel Corp., Richard City, Tenn., 500 shares no par value. George G. Shaw, Charles C. Moore and R. M. Hutchinson.

Super Concrete Corp., Cincinnati, Ohio, 250 shares no par value. Louis Richter, August Richter, Jr., E. R. Mecklenburg and Earl P. Holwadel.

Courtois Sand and Gravel Co., Central Falls, R. I., 100 shares preferred at $100 each and 50 shares common, no par value. A. F. Courtois, 68 Darling St., Central Falls.

Smith Silica Sand Co., Inc., South Toms River, N. J., $25,000. Walter C. Smith, Brooklyn, N. Y.; Herman Kahn, New York City, and Walter C. Smith, Toms River.

National Asbestos and Asphalt Co., 1705 W. Pershing Rd., Chicago, Ill., 100 shares common, no par value. Robert and Helen Mary Phelan and Robert H. Patterson. To manufacture and deal in asbestos and asphalt products.

Quarries

Lynn Sand and Stone Co., Swampscott, Mass., had its plant damaged by fire in December.

J. E. Osborn and Son have installed an automatic loader for trucks at their plant in Belle Center, Ohio.

Paulding, Ohio. The plant of the Long quarry near Allentown was recently damaged by fire and destroyed an engine recently purchased.

Meshberger Bros., Bluffton, Ind., have started operation of the Blue Creek stone quarry near Willshire, Ohio, which they bought about a year ago.

Whitehouse Stone Co. has had a receiver appointed for Builders and Industrial Supply Co., Toledo, Ohio. The receiver will continue to operate the business under orders and instructions of Common Pleas Court.

Sand and Gravel

Parkersburg Gravel Co., Marietta, Ohio, has purchased the steamer *Leroy*. It will convert the boat for towing.

Heyward Taylor, Munsey Bldg., Baltimore, Md., is reported to be in the market for a gravel deposit in Maryland or Virginia.

Bode Gravel Co., San Francisco, Calif., recently had a warehouse destroyed by fire. Plans have been made to rebuild the structure immediately.

Minden Gravel Co. is repairing its plants at Delight, Ark., to resume operation. Plant has been shut down for more than a year. Orders to provide three months operation are on hand it is stated.

Tuscumbia, Mo. A representative of the U. S. War Department recently was here to hear complaints against J. A. Kerr, contractor, for taking gravel from alongside river properties. An agreement was reached and Mr. Kerr will soon start his operation.

Cement

Inland Portland Cement Co., Spokane, Wash., is reducing its capital stock to $200,000.

Alpha Portland Cement Co. has recently booked an order for 100,000 bbl. of cement at its Phoenix, Ariz., plant for highway projects in Mississippi.

Colorado Portland Cement Co., Denver, Colo., had a large advertisement in the New Year issue of the *Denver Post* urging permanence in all types of construction and illustrating many types of construction work for which cement is best adapted.

Boston, Mass. Representatives of British cement manufacturers have been in the Boston market lately trying to interest local buyers, it is reported. It is anticipated that some of the British product will soon be here although none has been brought in to date.

Lime

Missouri Lime and Mining Co. has opened an experimental kiln at Seneca, Mo., and plans to operate a hydrate plant if the quality of the lime is satisfactory.

Moore Lime Co., Eagle Rock, Va., has been purchased by J. W. Seay, Roanoke, Va., and associates.

Gypsum

John McNeill of Sydney, N. S., acting for undisclosed interests, has purchased assets of the Iona Gypsum Co. to satisfy defaulted interest claims amounting to $20,000. The company has outstanding $100,000 in preferred stock, $115,000 common and $100,000 bonds.

Cement Products

Vang Co., Gallipolis, Ohio, recently installed ready mixed concrete equipment.

F. M. WELCH ENGINEERING SERVICE, Inc.

CONSULTING ENGINEERS . . . . GREENVILLE, OHIO

25 years experience in

Designing modern gravel plants and modernizing old plants.

Increasing capacities and reducing production costs.

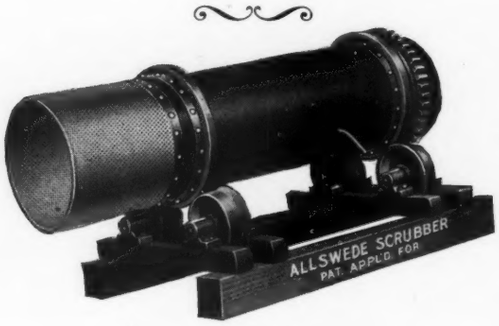
Perfecting of screening, washing, crushing, storing and mixing facilities.

Elevating, excavating, transporting and loading problems.

Appraisals, reports, surveys, property tests and preliminary investigations.

Our experience covers dry deposits, suction dredge operations and dragline excavating.

We specialize in all kinds of scrubbing problems involving CRUSHED STONE OR GRAVEL.



The ALLSWEDE SCRUBBER positively removes mud and clay balls from stone and gravel and materially reduces soft stone content.

Hitch-hiking *that is profitable*

Laying the Cordeau across the floor of the blast, connecting the holes in *planned* order—this is the final hook-up that makes for successful blasting, full work from your explosives, better fragmentation.

Each Cordeau detonated hole will "go" for its full length, and each row of holes will "go" in its proper order in the plan, for the lines of Cordeau are the arteries of a detonating wave that will travel at 3 miles per second.

Connect Cordeau carefully. You have time to do this for you have saved time in loading and you will save more time in clearing away after the blast.

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